ATTACHMENT B-2 OF AMENDED SSC

OPERATION & MAINTENANCE MANUAL

Eureka Mills Superfund Site

City of Eureka, Utah

July 31, 2009

This Operation and Maintenance Plan is considered to be final, however, at Construction Completion, this Operation and Maintenance Plan will be revised to incorporate any changes to the design made during the Remedial Action. At the same time, references to the detailed "as-built" drawings for each remedial action feature and the "As-built" drawings themselves will be incorporated into the Plan. In the interim, refer to the design drawings in the Remedial Action Work Plan when reviewing this O & M Plan.

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LIST OF ACRONYMS, ABBREVIATIONS, AND SHORT FORMS

ADS	Brand name for flexible polyethylene pipe
ASTM	American Society for Testing and Materials
ATV	All-Terrain Vehicle
CFR	Code of Federal Regulations
Chief	Chief Consolidated Mining Company
City Yard	Eureka City Maintenance Yard
CMP	corrugated metal pipe
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
Eureka	City of Eureka
F	Fahrenheit
FIS	Flood Insurance Study
ft.	feet
g	Acceleration due to gravity
H	Horizontal
HAZWOPER	hazardous waste operations
HDPE	high-density polyethylene
Hwy	Highway
mg/kg	milligram per kilogram
MSDS	Material Safety Data Sheet
MSE	Mechanically Stabilized Earth
NHPA	National Historic Preservation Act
NLMC	North Lily Mining Company
No.	number

LIST OF ACRONYMS, ABBREVIATIONS, AND SHORT FORMS (CON'T)

NOAA	National Oceanic and Atmospheric Administration
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
PRCS	permit required confined space
PRP	Potentially Responsible Party
RAS	Remedial Action Structure
RCP	reinforced concrete pipe
Remedial Action	Eureka Mills Superfund Site Remedial Action
Site	Eureka Mills Superfund Site
State	the State of Utah
US	United States
V	Vertical

1 INTRODUCTION

This Operation & Maintenance (O&M) Manual identifies inspection, operation, maintenance, and record-keeping activities to be implemented following completion of the Eureka Mills Superfund Site Remedial Action (Remedial Action). The purpose of this O&M Manual is to describe the requirements that shall be met to ensure that the integrity of the Remedial Action will not be compromised and that constructed features of the Remedial Action remain protective of human health and the environment. The recommended program of monitoring will provide long-term cost savings by controlling the magnitude of required maintenance. If necessary, this O&M Manual may be revised at the completion of the Remedial Action to reflect as-constructed conditions that were minor changes to the remedial design. It is anticipated that the as-constructed conditions will not require significant changes to the scope of the O&M requirements contained in this O&M Manual.

This O&M Manual does not address the requirements for implementing land use controls to be developed and adopted by the City of Eureka (Eureka) and Juab County in the State of Utah (State) to manage and control future development in the residential or non-mine waste areas of the Eureka Mills Superfund Site (Site). Under the land use controls to be developed, there will be general requirements for managing the excavation of contaminated soils as well as minimal maintenance of the protective cover (vegetative soil cover or gravel driving areas) that will be installed at each property in the residential areas as part of the Remedial Action. The individual property owners in the residential areas and non-mine waste areas of the Site will be responsible for maintaining the protective cover on their property.

If an unforeseen situation arises that is outside the scope of this O&M Manual, it will be assessed by the State of Utah, the Environmental Protection Agency (EPA) and where applicable, the potentially responsible party (PRP) or entity responsible for O&M to determine the appropriate response. The following paragraphs briefly describe the Sections and Appendices to this O&M Manual and the purpose and use of the information provided:

- Section 2 of this O&M Manual describes the components of the Remedial Action that are addressed by this O&M Manual. The components are functionally divided as follows:
    - Capped waste sites
    - Open lands
    - Drainage structures
    - Haul roads
    - Open Cell
- Section 3 describes health and safety requirements applicable to performing O&M activities and defines some of the activities that may involve the handling of soils containing lead and other metals which pose a human health hazard. This section, coupled with Appendix A, does not constitute a site specific health and safety plan nor is it intended to relieve any entity performing services or work pursuant to this O&M Manual from following all applicable Occupational Safety and Health Administration (OSHA) requirements.

- Section 4 addresses general inspection and maintenance requirements of this O&M Manual.
- Section 5 addresses specific inspection and maintenance requirements for capped waste sites.
- Section 6 addresses specific inspection and maintenance requirements for Site-wide drainages.
- Section 7 addresses specific inspection and maintenance requirements for Site access roads.
- Section 8 addresses specific inspection and O&M requirements for the Open Cell Repository.
- Section 9 addresses material specifications for the O&M activities. Specific inspection and maintenance requirements for open lands are included with other components in the O&M Manual. Figure 1 in this O&M Manual shows the areas addressed by the Remedial Action.
- Appendix A provides information for the protection of workers providing services or work described in this O&M Manual. This information is provided as guidance. Entities performing operation and maintenance pursuant to this O&M Manual are responsible for assuring a safe and healthy work environment for their employees and following all applicable Occupational Safety and Health Administration (OSHA) requirements.
- Appendix B provides as-constructed drawings for the completed Remedial Action Structures constructed for the Eureka Mills Superfund Site. At the time of publication of this document, not all Remedial Action Structures have been constructed. This O&M Manual will be periodically updated to include as-constructed drawings following the construction completion of Remedial Action Structures.
- Appendix C provides the material specifications used during the construction of the Remedial Action Structures and residential remediation at the Eureka Mills Superfund Site. The specifications contain sections specific to the construction effort and thus should not be used verbatim, but to provide the basis for selecting and installing materials for operation and maintenance activities.
- Appendix D provides the inspection forms to be used to document inspections completed pursuant to this O&M Manual. At the time of publication of this document, not all Remedial Action Structures have been constructed. This O&M Manual will be periodically updated to include inspection forms for Remedial Action Structure following construction completion.
- Appendix E provides a map which generally defines area in and around the City of Eureka that have been designated “Open Lands” by the EPA.
- Appendix F contains the Appendix A to City of Eureka Utah Zoning Ordinance Chapter 13, Regulations and Permitting Procedures for Excavations and Development in the Eureka Mills Superfund Site. At the time of publication of this document, this ordinance has not been adopted by the City of Eureka and is in draft form. This Appendix to the O&M Manual to include the adopted ordinance. The City of Eureka may, from time to time, update or revise the ordinance. It is the responsibility of the entity performing

operation and maintenance pursuant to this O&M Manual to comply with the current regulations of City of Eureka as it applies to the use of imported backfill material.

2 COMPONENTS OF THE REMEDIAL ACTION

2.1 Capped Waste Sites

To mitigate the spread of contaminated material from the mine waste piles to resident receptors in Eureka, protective caps will be constructed on the waste piles. The caps will be comprised of one of the following:

- Permeable riprap overlying geotextile fabric
- Permeable riprap overlying a graded aggregate filter
- Cohesive soils overlying geotextile fabric with a vegetative cover to prevent erosion

The purpose of the geotextile fabric is to prevent contaminated fine-grained material in the tailings from migrating into the interstices of the riprap and potentially escaping the cap. In some locations, a granular filter material will be placed beneath the coarser cap material instead of a geotextile fabric, but both will function as a filter to prevent fines from migrating through the cap. At many of these capped mine waste sites, runoff control structures (e.g., drainage berms and culverts) and access roads are integral components of the cap system. If the runoff control structures are confined to the cap system at a specific area, they are discussed as part of the capped waste site. Site-wide drainage structures, which are described in Section 2.2 of this O&M Manual, are designed to capture surface runoff from multiple remediation areas. Likewise, major access roads, which are described in Section 2.4, will provide access to large portions of the Site.

At some capped mine waste piles, fencing will be installed around historic mining structures (e.g., loading chutes, head frames, and loading docks). These structures have been inventoried and classified as historic and eligible for the National Register of Historic Places pursuant to Section 106 of the National Historic Preservation Act (NHPA). Therefore, the contaminated mine waste immediately adjacent to these structures will not be capped due to concerns about the structural integrity of these structures. Fencing of these historic structures will protect the public from coming in contact with contaminated materials surrounding these structures and from the potentially dangerous conditions due to the uncertain structural integrity.

Capped mine waste piles are described below and are shown on the Site Map - Figure 1. As-constructed drawings for the project are presented in Appendix B. The as-constructed drawings provide more detailed information on the components of each of the capped mine waste piles.

2.1.1 Gemini & Bullion Beck Mine Waste Piles

The Gemini & Bullion Beck Mine Waste Piles are located on the western side of Eureka, north of United States (US) Highway 6 (Hwy 6), and on the south slope of Keystone Ridge; refer to Figure 1 – Site Map for the location. This site is composed of the following three areas:

- Gemini Mine Waste Pile
- Bullion Beck Mine Waste Pile

- Bullion Beck Mill

Lower Eureka Gulch runs along the base of the Gemini Mine Waste Pile, adjacent to Hwy 6, before bisecting the Bullion Beck Mine Waste Pile. The head frame for the Bullion Beck mine is located on the portion of the Bullion Beck Mine Waste Pile adjacent to Hwy 6. A State historic monument marks the head frame. The head frames at both the Gemini & Bullion Beck Mine Waste Piles were protected from damage during the remediation.

The Bullion Beck Mill is up the slope above the Eureka City Maintenance Yard (City Yard), which is located on the part of the Bullion Beck Mine Waste Pile on the north side of Lower Eureka Gulch. Adjacent to the streambed in the bottom of Lower Eureka Gulch, a service road runs on top of city sewer and water lines. The city sewer line carries sewage to the Eureka City water treatment plant approximately 2 miles west of town. The city water line carries fresh drinking water to the City's water tank from the City's well approximately 3 miles west of town. All-Terrain Vehicle (ATV) riders from town also use the service road.

Based on sampling completed prior to the remediation, lead concentrations at the Gemini & Bullion Beck Mine Waste Piles ranged from 250 to 25,000 milligrams/kilogram (mg/kg). Lead concentrations on the service road ranged from 650 to 11,000 mg/kg.

The mine waste piles are graded to stable slopes and covered with geotextile fabric or a filter material and 18 inches of rock cap. The top of the Gemini Mine Waste Pile and the City Yard on top of the Bullion Beck Mine Waste Pile are capped with a geotextile fabric and 18 inches of road base. Lower Eureka Gulch is designed to convey the 100-year flood event. The channel was regraded, covered with geotextile fabric, and lined with riprap. See Appendix B-1, Drawing AC2-1 and AC2-2 and AC2-13 for the As-Constructed Plans of Gemini & Bullion Beck Mine Waste Piles.

The following paragraphs describe the major features that comprise the Gemini & Bullion Beck Mine Waste Piles site. The referenced As-Constructed Plans provide the location of these major features.

2.1.1.1 Fenced Areas

A wooden, split rail fence is installed on the top of the Gemini Mine Waste Pile along the perimeter of the slope. In addition, fence posts were installed around historic mine portals: one east of the Bullion Beck Mine Shaft and one at the Keystone Mine located north of the City Yard. At each location four fence posts were installed to demarcate the location of the mine portals. The locations are shown in the as-constructed drawings.

2.1.1.2 Gemini/Bullion Beck Drainage Berm

A drainage berm was constructed on the north side of the City Yard that extends through the draw on the western edge of the Gemini Mine Waste Pile and then along the north side of the Gemini Mine Waste Pile. The drainage berm catches potentially contaminated runoff from the vegetated slopes above the mine waste piles and conveys the contaminated runoff away from the remediated areas. The runoff is

discharged into Eureka Gulch. The drainage, which is designed for a 100-year storm event, is lined with riprap underlain by geotextile.

The vegetative slope between the City Yard and the Bullion Beck Mill site was not remediated. Soils in this area are contaminated with high levels of lead and arsenic; however, the slope was not disturbed during the remediation so the existing, native vegetation should be adequate in maintaining a stable non-erosive slope. In addition, that this area is not typically used for either residences or recreation. This area will be monitored during inspections for evidence of erosion or changes in the adequacy of the vegetative cover.

2.1.1.3 Northeast Gemini Access Road

The Northeast Gemini Access Road provides access to the top of the Gemini Mine Waste Pile from Last Chance Road on the northeast side of the Gemini Mine Waste Pile. A gate located near the intersection of Last Chance Road and the Northeast Gemini Access Road controls access to the Gemini Mine Waste Pile. The Northeast Gemini Access Road is 24 feet wide and constructed of 12 inches of road base underlain by 8-ounce geotextile fabric.

2.1.1.4 City Yard Access Road

The City Yard Access Road provides access to the City Yard from Hwy 6. Access is controlled by a gate located near the intersection of the City Yard Access Road and Hwy 6. The City Yard Access Road is 24 feet wide and is constructed of 18 inches of road base underlain by 8-ounce geotextile fabric.

2.1.1.5 West Gemini Access Road

The West Gemini Access Road provides access to the top of the Gemini Mine Waste Pile from the City Yard. Access is controlled by a gate located at the property boundary between the City of Eureka and Chief Consolidated Mining Company (Chief). The West Gemini Access Road is a minimum of 24 feet wide and is constructed of 12 inches of road base underlain by 8-ounce geotextile fabric.

2.1.1.6 Bullion Beck Mill Access Road

The Bullion Beck Mill Access Road provides access to the Bullion Beck Mill site from the top of the Gemini Mine Waste Pile. Access is controlled by a gate located approximately 200 feet north of the Bullion Beck Mill Site. The Bullion Beck Mill Access Road is 24 feet wide and is constructed of 12 inches of road base underlain by 8-ounce geotextile fabric.

2.1.1.7 Lower Eureka Gulch Service Road/ATV Path

The Service Road/ATV Path starts west of the City Municipal Building, located at the intersection of Church Street and Hwy 6, and continues west to near the west end of Cole Canyon. The path is aligned adjacent to Lower Eureka Gulch and crosses over the City Yard Access Road. During high runoff events, flows in Eureka Gulch may deposit sediments on the path. Therefore, the path is overlain by 3 inches of asphalt from the City Municipal Building to just beyond the Gemini & Bullion Beck Mine Waste Piles site, at the point where the Eureka Gulch diverges to the north. The

asphalt overlay provides erosion protection and, if sediments are deposited on the path, allows cleaning with water without erosion of the road base material. West of the asphalt surfacing, the remainder of the path is constructed of 12 inches of road base underlain by 8-ounce geotextile fabric.

2.1.1.8 Gemini Retaining Wall

On the south and east sides of the Gemini Mine Waste Pile, a two-tiered retaining wall, with each tier approximately 10 feet high, was constructed at the base of the slope. The retaining wall is approximately 540 feet long and is designed to create a stable slope while minimizing the impact to private property and minimizing the movement of mine waste material.

A Mechanically Stabilized Earth (MSE)-type retaining wall was selected for this application. The MSE retaining wall is constructed of welded wire panels and backfilled with aggregates. The advantages of using the MSE retaining wall include low cost, flexibility, capability to absorb deformations, and aesthetics that blend with the existing environment.

Survey markers were placed at the top of the retaining wall at 200 foot intervals to monitor any movement of the wall. The markers shall be surveyed for elevation and horizontal location biennially (once every two years) by a Utah Registered Land Surveyor. The survey will have an accuracy of 0.01 ft. vertical and 0.1 ft. horizontal. After the first five years, the data will be reviewed and the frequency of surveying will be adjusted, if appropriate. Refer to Appendix B-1, As-Constructed Drawings AC2-1 and AC2-2 for tables with the initial survey elevations and horizontal positions of the retaining wall survey markers.

2.1.2 Chief Mine No.1 Waste Pile

The Chief Mine No. 1 Waste Pile site is located west of Eagle Street on the south side of Eureka; refer to Figure 1 – Site Map for the location. Primary access to the top of the Chief Mine No.1 Mine Waste Pile is through a gate at the intersection of Haulage Street and Eagle Street.

The mine waste pile was built around the Chief Mine No. 1 mineshaft and contains approximately 500,000 cubic yards of contaminated mine waste. The west end of this mine waste site serves as the repository for contaminated residential soils generated during the Residential Remedial Action. Lead concentrations at the surface of the existing waste pile range from 505 to 13,000 mg/kg.

The Chief Mine No.1 Waste Pile including the repository is capped with a geotextile on all slopes and covered by an 18-inch rock cap. The top surface of the mine site is capped with a geotextile fabric overlain by 12 inches of road base. The geotextile provides a filter to prevent fines from migrating through cap materials. See Appendix B-6, Drawing AC2-29 and AC2-3 (to be added at a later date) for the As-Constructed Plans of Chief Mine No. 1 Waste Pile. Drawings AC2-29a and AC2-29b display as-constructed cross sections of Chief Mine No. 1 Waste Pile.

The following paragraphs describe the major features that comprise the Chief Mine No. 1 Waste Pile site. The referenced As-Constructed Plans provide the location of these major features.

2.1.2.1 Fence on the Top Mine Surface

During remediation, the top of the mine surface was used as a management area. To secure the management area a fence was constructed. The fence is a four foot high Type D stock fence constructed in accordance with project specifications. Refer to Appendix C.1 for the fence specifications. There were two modifications to the requirements:

- Smooth wire was used in place of barbed wire
- "Easy Fence" stabilization brackets were used in place of gate, line, corner, and terminal braces shown on the drawing contained in Appendix C.1. Product data sheets on the "Easy Fence" are provided in Appendix C.1.

These modifications were incorporated into all stock fences constructed at the Eureka Mills Superfund Site

Within the limits of the Chief Mine No.1 Waste Pile site are many buildings from the historic mining era that will be left in place. The areas around many of these historic buildings will be capped. Besides these buildings, there are other historic structures, including the mineshaft (which will be capped), a network of small gage rail for mine cars, and an adjacent loading area. The mineshaft, car rail, and loading area will be fenced. To avoid disturbing these historically significant structures, the mine wastes inside the fence area will not be capped.

2.1.2.2 Chief Mine No. 1 Drainage Channel

The Chief Mine No.1 Waste Pile site has a drainage channel on the south side of the waste pile to convey runoff from the top of the waste pile to the Eagle Blue Bell Drainage Channel. The drainage channel is three feet deep with a 2.5 foot wide bottom and is lined with Class 1 riprap.

2.1.2.3 Chief Mine No. 1 North Toe Drainage Channel

The Chief Mine No.1 Waste Pile site has a drainage channel on the north and west sides at the toe of the capped slopes to convey runoff from the slopes to the Eagle Blue Bell Drainage Channel. The drainage channel prevents runoff from the mine waste pile from entering the residential areas downgradient and to the north. The drainage Channel is lined with Class 1 riprap.

2.1.2.4 Chief Mine No. 1 North Access Road

Along the toe of the north slope of the Chief Mine No.1 Waste Pile is the North Access Road that spans from Eagle Street west to the Open Cell Access Road. The access road is approximately 20 feet wide and is capped by with a geotextile fabric overlain by 12 inches of road base.

2.1.2.5 Chief Mine #1 North Boundary Fence

On the north side of the Chief Mine #1 Access Road, a 4 foot high stock fence was constructed approximately 10 feet north of the edge of the road.

2.1.2.6 Chief Mine No. 1 Loading Chutes

On the north side of the Chief Mine No.1 Waste Pile near Eagle Street are wooden loading chutes from historic mining operations. The north side of the waste pile was regraded in a manner which preserved these loading chutes.

2.1.2.7 Chief Mine No. 1 North Benches

Benches of varying width were constructed on the north side of the Chief Mine #1 waste pile. The benches were capped with 18 inches of soil and vegetated. The soil cap consists of 12 inches of random fill from the Homansville Borrow Pit and 6 inches of topsoil.

2.1.2.8 Chief Mine No. 1 Connecting Road

This road is located on the north slope of the Chief Mine #1 Mine Waste Pile to provide access from the North Access Road to the top of the mine waste pile. The access road is located near the Chief Mine #1 Loading Chutes and is approximately 20 feet wide and is capped by with a geotextile fabric overlain by 12 inches of road base.

2.1.3 Snowflake Mine Waste Pile

The Snowflake Mine Waste Pile is located south of Chief Mine No.1 between the Eagle Blue Bell Mine Transition and the Open Cell; refer to Figure 1 – Site Map for the location. This mine waste pile can be accessed from the Open Cell Access Road.

Lead concentrations at this waste pile range from 600 to 5,900 mg/kg. The majority of the mine waste pile hauled to the Open Cell for use as backfill for the construction of the Open Cell berm. The footprint of the waste pile was capped with a geotextile and covered by an 18-inch rock cap. See Appendix B-7, Drawing AC2-4 for the As-Constructed Plan of the Snowflake Mine Waste Pile.

The following paragraph describes the major feature that comprises the Snowflake Mine Waste Pile. The referenced As-Constructed Plan provide the location of these major features.

2.1.3.1 Snowflake Access Road

The Snowflake Access Road begins east of the Eagle Blue Bell Channel Snowflake Texas Crossing and extends across the bottom of the Snowflake Mine Waste Pile. The road is 15 to 25 feet wide and is constructed of 12 inches of road base underlain by 8-ounce geotextile fabric.

2.1.3.2 Fencing

The open shaft at the Snowflake Mine is surrounded by a 6-foot chain-link fence.

2.1.4 Eagle Blue Bell Mine Waste Pile

The Eagle Blue Bell Mine Waste Pile site is located directly south of the Chief Mine No.1 Waste Pile and west-southwest of Eagle Street; refer to Figure 1 – Site Map for the location. This site is composed of the following three areas, which are collectively referred to as the Eagle Blue Bell Mine Waste Pile:

- Eagle Blue Bell Mine
- Eagle Blue Bell Transition
- Eagle Blue Bell Mine Dump

Eagle Blue Bell Mine is the uppermost mine waste pile and is separated from the Eagle Blue Bell Mine Dump directly south of the Chief Mine No.1 Waste Pile by the Eagle Blue Bell Transition. The Eagle Blue Bell Mine, located at the top of the slope, has an open shaft, the hoist house, wood structures, and a timber head frame with wooden loading chutes at the base of the top mine waste pile. The wooden loading chutes are visible from the center of town. Due to deterioration of the structure, portions of the wooden loading chutes blew down during high winds in the summer of 2007 after the completion of the remediation of the Eagle Blue Bell Mine.

Some of the mine waste material was removed from the Eagle Blue Bell Mine Dump and Eagle Blue Bell Transition by the North Lily Mining Company (NLMC) for their heap leach operation conducted southwest of Eureka. Lead concentrations at the mine waste piles range from 930 to 15,950 mg/kg.

The slopes of these mine waste piles were graded to a stable configuration. The slopes are covered by a combination of Type 1 Cover System (geotextile covered by an 18 inches of armor) and Type 2 Cover System (8 inches of coarse filter covered by 10 inches of armor). The flat area around the mine waste buildings and the mine shaft were capped with 12 inches of road base underlain by geotextile fabric.

On the east side of the Eagle Blue Bell Mine, two benches were constructed to facilitate capping of this relatively steep area. The benches were capped with 12 inches of road base underlain by geotextile fabric. In addition, water bars were constructed across the benches to convey runoff off the benches, preventing possible erosion. The water bars are constructed of armor, are approximately three feet wide, and extend approximately one foot above and below the surrounding grade. See Appendix B-7, Drawing AC2-4 and AC2-5 for the As-Constructed Plans of the Eagle Blue Bell Mine Waste Pile.

The following paragraphs describe the major features that comprise the Eagle Blue Bell Mine Waste Pile site. The referenced As-Constructed Plans provide the location of these major features.

2.1.4.1 Fenced Areas

The open shaft at the Eagle Blue Bell Mine is fenced with a six foot high chain link fence. A six foot wide gate is located on the east side of the fence. A separate fence was constructed around the Eagle Blue Bell Loading Chutes to limit access near the loading chutes. The mine wastes inside this fenced area were not capped due to concerns regarding the structural integrity of the timber loading chutes and to avoid

disturbing these historically significant structures. The fence surrounding the loading chutes is a six foot high chain link fence. The fence has two access gates: a six foot wide gate is located on the south side of the fence and a 16 foot gate located on the north side.

2.1.4.2 Eagle Blue Bell West Channel

The Eagle Blue Bell West Channel directs runoff from the south slope above Eagle Blue Bell Mine, on the west side, to the Eagle Blue Bell Drainage Channel. This drainage berm is riprap lined and sized to contain the 25-year storm event. Geotextile is placed under the riprap.

2.1.4.3 Eagle Blue Bell Upper Channel

The Eagle Blue Bell Upper Channel directs runoff from Eagle Canyon across the Eagle Blue Bell Upper Access Road and into the Eagle Blue Bell Drainage Channel. This channel is armor lined and geotextile is placed under the armor. The flows collected in this channel may be contaminated due to the historic mining that took place at the Victoria Mine above the Eagle Blue Bell Mine. The Victoria Mine is outside the southern Superfund site boundary.

2.1.4.4 Eagle Blue Bell West Channel

The Eagle Blue Bell West Channel directs potentially contaminated runoff from Eagle Canyon above Eagle Blue Bell Mine from the mine waste cap to the Eagle Blue Bell Drainage Channel. This drainage channel is riprap lined and sized to contain the 25-year storm event. Geotextile is placed under the riprap.

2.1.4.5 Fitchville Drainage Channel

The Fitchville Drainage Channel collects runoff from the Eagle Blue Bell Lower Access Road and from the Eureka neighborhood east of the Eagle Blue Bell Mine, known locally as Fitchville. This channel directs drainage to the north. This channel terminates near the north end of the Eagle Blue Bell Lower Access Road where it is directed into an 18 inch HDPE culvert that flows into the Eagle Blue Bell Lower Channel.

2.1.4.6 Eagle Blue Bell Lower Channel

The Eagle Blue Bell Lower Channel directs runoff from the south slope of the Eagle Blue Bell Mine Dump to the Eagle Blue Bell Drainage Channel which flows into Lower Eureka Gulch near the Bullion Beck head frame.

2.1.4.7 Eagle Blue Bell Lower Access Road and Haul Route

The Eagle Blue Bell Lower Access Road provides access to the Eagle Blue Bell Mine and the Chief Mill Site #1 Access Road. Its entrance is located at Eagle Street, just south of the Chief Mine No. 1 main gate. At about half its length up the mine waste pile, the Lower Access Road splits to create the Eagle Blue Bell Haul Route. The Eagle Blue Bell Haul Route rejoins the Eagle Blue Bell Lower Access Road near the intersection with the Chief Mill Site #1 Access Road. The Eagle Blue Bell Haul Route was constructed to provide operational flexibility and enhance safety during

construction. Each of these roads is approximately 15 feet wide and constructed of 12 inches of road base underlain by 8-ounce geotextile fabric.

2.1.4.8 Eagle Blue Bell Upper Access Road

The Eagle Blue Bell Upper Access Road provides access to the top of the Eagle Blue Bell Mine. Its entrance is located at the junction of the Eagle Blue Bell Lower Access Road and the Chief Mill Site #1 Access Road, just north of the Eagle Blue Bell Loading Chutes. The access road extends south to the top of the mine. The road is approximately 25 feet wide and constructed of 12 inches of road base underlain by 8-ounce geotextile fabric. Near the top of the mine, there is a wide, relatively flat area to the east of the road that is also capped with 12 inches of road base underlain by 8-ounce geotextile fabric. Water bars, similar to those constructed on the benches on the east side of the Eagle Blue Bell Mine, were constructed between the Upper Access Road and the relatively flat area to prevent possible erosion.

2.1.5 Eureka Hill Mine Waste Pile

The Eureka Hill Mine Waste Pile site is located on the west side of Eureka, south of Hwy 6, and due south of the Gemini & Bullion Beck Mine Waste Piles site; refer to Figure 1 – Site Map for the location. The Eureka Hill Mine Waste Pile is accessed from the Open Cell Access Road. Lead concentrations from 580 to 29,300 mg/kg have been detected at this mine waste pile.

The waste pile was regraded to a stable configuration and capped. Sloped areas are capped with 12 ounce geotextile and 18 inches of armor. Relatively flat areas, including a large area at the southeast corner of the waste pile and benches are capped with 18 inches of road base underlain by 8 ounce geotextile.

There was concern that the large area could be susceptible to erosion due to its size and slope, which averages about 5%. For this reason, five water bars were installed across the area. The water bars are constructed of road base and are approximately 18 inches high and six feet wide in cross-section. The water bars are orientated approximately west to east and slope east, at a grade of approximately 1%, conveying runoff into the Open Cell Drainage Channel. The water bars are spaced approximately 75 feet apart.

See Appendix B-8, Drawing AC2-6 for the As-Constructed Plan of the Eureka Hill Mine Waste Pile.

The following paragraphs describe the major features that comprise the Eureka Hill Mine Waste Pile site. The referenced As-Constructed Plans provide the location of these major features.

2.1.5.1 Fenced Areas

The Eureka Hill Waste Pile has an open shaft, timber head frame, and wooden structures that are fenced. The mine wastes inside this fenced area were not capped due to concerns of the structural integrity of the structures and head frame. The fence that surrounds these structures is a six foot chain link fence with a ten foot wide gate on the north side.

2.1.5.2 Eureka Hill Drainage Channel

The Eureka Hill Drainage Channel is constructed on the downslope (to the northwest) side of Eureka Hill to collect runoff from the site and convey flows north to the Eagle Blue Bell Drainage Channel. The channel is designed to convey the 25-year storm event and is lined with Class 1 riprap. An 18 inch corrugated HDPE pipe was installed to convey flows below the Open Cell Access Road. From the outlet of the corrugated HDPE pipe the Eureka Hill Drainage Channel extends north until it empties into the Eagle Blue Bell Drainage Channel.

2.1.5.3 Eureka Hill Toe Drain

The Eureka Hill Toe Drain was constructed on the north side of Eureka Hill to collect runoff from the waste pile and convey flows west to the Eureka Hill Drainage Channel.

2.1.5.4 West Eureka Road

The West Eureka Road is constructed on the south side of the Eureka Hill Drainage Channel to provide access to properties west of Eureka Hill. West of the intersection of the West Eureka Road and the Open Cell Access Road, the Eureka Hill Texas Crossing conveys flows from the Eureka Hill Toe Drain across the West Eureka Road and into the Eureka Hill Drainage Channel.

2.1.6 Open Cell Repository

The Open Cell Repository is located between the Snowflake and Eureka Hill Waste Rock, on the south-west side of Eureka, and south of Chief Mine No. 1; refer to Figure 1 – Site Map for the location. This site can be accessed from the Open Cell Access Road. The Open Cell will be used as a long-term repository for lead-contaminated soils generated by the community following the completion of the remedial activities for the Eureka Mills Superfund Site. Disposal of contaminated soils in the Open Cell will be regulated by the City of Eureka through administration of institutional controls.

The berms that form the Open Cell were constructed of soils generated during the excavation of the Open Cell; mine waste hauled from the Snowflake Mine Waste Pile, and contaminated soils generated from the Residential Remedial Action. The contaminated materials generated during future development activities will be capped by the operator with 18 inches of cap material underlain by geotextile once the Open Cell reaches design capacity. Currently, the EPA is considering revising the final cap to properly grading the cap and establishing a vegetative cap on the final lift of contaminated soil through hydroseeding. Any changes in the final design will be reflected in future revisions to this O&M Manual. The exterior side slopes of the Open Cell were capped with 18 inches of armor underlain by geotextile fabric during the Remedial Action. See Appendix B-9, Drawing AC2-7 for the As-Constructed Plan of the Open Cell Repository (to be added at a later date).

The following paragraphs describe the major features that comprise the Open Cell Repository site. The referenced As-Constructed Plans provide the location of these major features.

2.1.6.1 Open Cell Drainage Channel

A drainage channel collects runoff from south (upslope) of the Open Cell. The channel conveys the flow through culverts to the Eagle Blue Bell Drainage Channel which discharges into Eureka Gulch. The areas south of the Open Cell will not be remediated and therefore runoff from these areas may be contaminated. Based on hydrologic analysis, the eastern portion of the channel was capped with armor and underlain by 12 ounce geotextile. The western portion of the Open Cell Drainage Channel, which receives the majority of the runoff from the south, is constructed of Class 1 riprap and underlain by 12 ounce geotextile.

2.1.6.1.1 OC-1 Culvert

Drainage captured by Open Cell Drainage Channel which flows east is conveyed to the Eagle Blue Bell Drainage Channel through the OC-1 Culvert beneath the Open Cell Access Road. This culvert is an 18-inch diameter HDPE pipe with flared end section

2.1.6.1.2 OC-2 Culvert

Drainage captured by Open Cell Drainage Channel which flows west is conveyed to the Eagle Blue Bell Drainage Channel through the OC-2 Culvert beneath the Open Cell Access Road. The OC-2 culvert is a 36-inch diameter HDPE pipe with flared end section.

2.1.6.1.3 OC-3 Culvert

The OC-3 culvert is an 18-inch HDPE pipe which drains the interior of the Open Cell. The culvert outlets into the Open Cell Drainage Channel on the west side of the Open Cell.

2.1.6.2 Open Cell Entrance Road

The Open Cell Entrance Road extends from the Open Cell Access Road to the interior of the Open Cell. . Access to the Open Cell is controlled by a gate across this road. The road is 15 feet wide and is constructed of 12 inches of road base underlain by 8-ounce geotextile fabric.

2.1.6.3 Water Source

A fire hydrant connected to the City of Eureka potable water supply system is located at the entrance to the Open Cell and near the Open Cell Decontamination Pad. Water from the hydrant will be used to provide water for dust control and moisture conditioning during placement and compaction of contaminated materials and to fill the decontamination pad.

2.1.6.4 Open Cell Decontamination Pad

A concrete decontamination pad is located near the entrance of the Open Cell to provide a location for trucks exiting the Open Cell to decontaminate. The decontamination pad drains in the Eagle Blue Bell Drainage Channel. A drawing showing the dimensions and the design details of the decontamination pad is provided in Appendix B-9.

2.1.6.5 Sources of Lead-Contaminated Soils to be Placed in the Open Cell

Only lead-contaminated soils or soils suspected to be lead contaminated derived from sources within the limits of the Eureka Mills Superfund Site may be placed in the Open Cell. Sources of lead-contaminated soils that may be placed in the Open Cell include, but are not limited to, the following:

- Residential and commercial development and re-development
- Sediments removed from basins, drainages, and culvert inlets
- Road repairs
- Underground utility repairs
- New underground utilities
- Landscaping activities and home improvement projects at existing properties

2.1.6.6 Source of Backfill

A quantity of uncontaminated soil and roadbase material that can be used for the final cover (if needed and available), and interim cover (if elected – see Section 8.2.2) at the Open Cell has been stockpiled east of Eureka. Refer to Figure 2 for the location of this material. This material is also available to Eureka City residents for use during building, renovation, and landscaping activities which require permits. If uncontaminated soils or roadbase material are unavailable from this source, other sources of uncontaminated soils or roadbase will need to be procured, located, and/or developed. Uncontaminated soil or roadbase material used for interim cover and the final cover shall meet the chemical criteria for imported backfill contained in City of Eureka, Utah Zoning Ordinance Chapter 13, Regulations and Permitting Procedures for Excavations and Development in the Eureka Mills Superfund Site, Appendix A – Sampling and Analysis Plan.

2.1.7 Chief Mill Site No. 1

Chief Mill Site No. 1 is located on the south side of Eureka, south of the old railroad grade and east of Reservoir Road; refer to Figure 1 – Site Map for the location. At this site, Chief constructed a mill in 1924. Site access will be controlled at a gate at Reservoir Road at the intersection of Beck Street and Chief Street. Secondary access is provided from the east on the Chief Mill Site No. 1 Access Road. Lead concentrations at this site are extremely high, ranging from 820 to 21,000 mg/kg.

The old concrete foundations at the Chief Mill Site No. 1 were demolished and landfilled on-site. The site will be backfilled with soils excavated from the Gardner Canyon Sedimentation Ponds. Relatively flat areas (flatter that 1V:5H) will be capped by a soil cap and vegetated. The soil cap consists of a geotextile fabric (marker barrier), 12 inches of random fill from the Homansville Borrow Pit and 6 inches of topsoil. Slopes steeper than 1V:5H will be covered by a 12 ounce geotextile filter and capped with 18 inches of armor. See Appendix B-10, Drawing AC2-8 for the As-Constructed Plan of the Chief Mill Site No. 1 Site (to be added at a later date).

On the north side of the Site, the Chief Mill Site No. 1 Drainage Channel collects runoff from the Site and conveys flows to a sedimentation pond in the Knightsville Drainage Channel. See Section 2.2.1 for a description of the Knightsville Drainage Channel.

2.1.8 Chief Mill No. 1/Chief Mill Tailings

The Chief Mill No. 1/Chief Mill Tailings site is located on the south side of Eureka, two blocks south of the intersection of Haulage Street and Main Street, north of the old railroad grade and northeast of the Chief Mill Site No.1; refer to Figure 1 – Site Map for the location. The area is composed of the following two features:

- Chief Mill No.1 (not to be confused with the Chief Mill Site No. 1 adjacent to Gardner Canyon)
- Chief Mill Tailings

The site is a large broad swale where the tailings from the Chief Mill Site No. 1 were disposed. Most of the tailings materials were removed from the site by NLMC for a heap leach operation that they conducted southwest of Eureka. Later, some, but not all, of the tailings materials were relocated by Chief to the Chief Mine No.1 Mine Waste Pile. The lead concentrations of the remaining tailings material and underlying contaminated soils range from 100 to 20,000 mg/kg.

The area will be graded, capped by soil, and revegetated. The soil cap will consist of 12 inches of random fill from the Homansville Borrow Pit and 6 inches of topsoil. A geotextile fabric will be placed beneath the soil cap to mark the extent of the soil cap.

This area includes the Sedimentation Pond CM1T-1 at the northern end of the tailings area. See Appendix B-11, Drawing AC2-14 for the As-Constructed Plan of Chief Mill No. 1/Chief Mill Tailings (to be added later).

The following paragraphs describe the major features that comprise the Chief Mill No. 1/Chief Mill Tailings site.

2.1.8.1 Chief Mill No 1/Chief Mill Tailings ATV Path

The asphalt-paved ATV access path will transect the site starting at Chief Street and terminating at its intersection with the Chief Mill Site No.1 Access Road at the southeast end of the site.

2.1.9 Chief Mine No. 2 Mine Waste Pile

The Chief Mine No. 2 Mine Waste Pile is located southeast of Eureka and west of Knightsville Road at the base of the north slope of Godiva Mountain; refer to Figure 1 – Site Map for the location. Lead concentrations at this waste pile range from below detection to 2,500 mg/kg.

The Chief Mine No. 2 Mine Waste Pile is capped with a 10-inch rock cover underlain by 8 inches of aggregate filter material. The flat surface at the top of the mine waste pile is capped by 12 inches of road base underlain by an 8-ounce geotextile fabric. See Appendix B-3, Drawing AC2-26 for the As-Constructed Plan of the Chief Mine No. 2

Waste Pile. Drawings AC2-26a, AC2-26b, and AC2-26c in Appendix B-3 display as-constructed cross sections, respectively, of Chief Mine No. 2 Waste Pile.

The following paragraphs describe the major features that comprise the Chief Mine No. 2 Mine Waste Pile site. The referenced As-Constructed Plans provide the location of these major features.

2.1.9.1 Fenced Areas

Chief Mine No. 2 has a historic steel head frame with an open shaft. In addition to the steel head frame, there is a steel building used for operation of the man-lifts into the shaft and several other buildings. To secure the open shaft area, the area around the shaft, hoist house, and buildings has been fenced. See Appendix B-3, Drawing AC1-11 for the As-Constructed Plan of the fencing installed at the Chief Mine No. 2 Waste Pile.

2.1.9.2 Chief Mine No. 2 Access Road

The Chief Mine No. 2 Access Road extends west from Knightsville Road to the top of Chief Mine No. 2. Access to the Chief Mine No. 2 Access Road is controlled by a gate at the intersection with Knightsville Road. The road is 15 feet wide and is constructed of 12 inches of road base underlain by 8-ounce geotextile fabric. Drainage from Sedimentation Pond KC-1 in Knightsville crosses over the Chief Mine No. 2 Access Road through a depression, or dip, in the road. See Appendix B-3, Drawing AC3-15 for the As-Constructed Plan of the Chief Mine No. 2 Access Road. Drawings AC3-15a, and AC3-15b, in Appendix B-3 display an as-constructed profile and as-constructed cross sections of Chief Mine No. 2 Access Road.

2.1.10 May Day/Godiva Mine Waste Piles

The May Day/Godiva Mine Waste Piles are located southeast of Eureka and west of Knightsville Road on the north slope of Godiva Mountain; refer to Figure 1 – Site Map for the location. The area consists of large mine waste piles around the following three key features:

- Godiva Tunnel (Lower)
- Godiva Shaft (Upper)
- May Day Shaft

These mine waste areas are situated relatively high on the mountainside and therefore are located on steep slopes, typically between 1V:2H to 1V:4H. The steep slopes immediately surrounding the mine waste piles are heavily vegetated with scrub oak and sagebrush. Although the soils in the heavily vegetated areas are also contaminated with high levels of lead and arsenic, they will not be capped. Remediation of these areas would provide little benefit because they are not typically used for recreation and existing vegetation minimizes erosion from wind and surface water. In addition, revegetation of these areas would be costly and may take an extended period of time to adequately re-establish vegetation. In the interim, the slope would be highly vulnerable to erosion. Lead concentrations at this area are extremely high, ranging from 250 to 69,000 mg/kg.

The May Day Mine Waste Pile is capped with an 18-inch rock cover underlain by a geotextile fabric. The Godiva Tunnel Mine Waste Pile is capped with a 10-inch rock cover underlain by 8 inches of aggregate filter material. The flat area on top of the Godiva Shaft is capped with geotextile and 12 inches of road base. See Appendix B-2, Drawing AC2-24 for the As-Constructed Plan of the May Day Mine Waste Pile. Drawings AC2-24a, AC2-24b, AC2-24c, and AC2-24d in Appendix B-2 display as-constructed cross sections of the May Day Mine Waste Pile.

See Appendix B-2, Drawing AC2-25 for the As-Constructed Plan of the Godiva Mine Waste Pile. Drawings AC2-25a, AC2-25b, AC2-25c, AC2-25d, and AC2-25e in Appendix B-2 display as-constructed cross sections of the Godiva Mine Waste Pile.

The following paragraphs describe the major features that comprise the May Day/Godiva Mine Waste Piles site. The referenced As-Constructed Plans provide the location of these major features.

2.1.10.1 Fenced Areas

The area has a historic wooden loading chute that has been fenced. The mine waste inside this fenced area was not capped due to concerns about the structural integrity of the wooden loading chute and the intent to preserve the historically significant structures. See Appendix B-2, Drawing AC1-11 for the As-Constructed Plan of the fencing installed at the May Day/Godiva Mine Waste Piles.

2.1.10.2 May Day Access Road

Access to the May Day/Godiva Mine Waste Piles is from the uppermost road, which will be controlled by a gate located at the point where the west end of road meets the cap for the Godiva Mine Waste Pile. This road, referred to as the May Day Access Road, provides access to the capped mine waste piles for maintenance activities. The access road is constructed to a width of approximately 15 feet wide and is constructed of 12 inches of road base underlain by 8-ounce geotextile fabric. Two lower access roads that historically provided access to the May Day/Godiva Mine Waste Piles are blocked by boulders and fencing. See Appendix B-2, Drawing AC3-14 for the As-Constructed Plan of the May Day Access Road. Drawing AC3-14a in Appendix B-2 displays an as-constructed profile of the May Day Access Road. Drawings AC3-14b AC3-14c in Appendix B-2 display as-constructed cross sections of the May Day Access Road.

2.1.10.3 Vegetative Slopes

Motorized access to the vegetative slopes near the May Day/Godiva Mine Waste Piles is controlled by fencing and the use of large boulders to block ATV trails surrounding the mine waste piles. Protection of the vegetative slopes is necessary to prevent erosion of the contaminated soils on these slopes.

2.2 Drainage Control Systems

Drainage control systems were designed based on the Flood Insurance Study (FIS) completed by the US Federal Emergency Management Agency. With the exception of the Gardner Canyon (see Section 2.2.4), the major drainage control features were designed to contain the 100-year flood volumes reported in the FIS. Refer to the Eureka Mills Superfund

Site Remedial Action Work Plan for details on the design. Figure 3 provides a map which highlights all drainage control systems requiring operation and maintenance.

Drainage control systems built as part of the Eureka Mills Superfund Site were constructed to do the following:

- Prevent recontamination of remediated areas
- Lower peak flows to lessen the potential for recontamination due to floods
- Capture potentially contaminated sediments
- Prevent concentration of flows onto private properties due to construction of remedial action structures

Drainage structures constructed at the Site include ditches, channels, sedimentation basins, and culverts. The drainage systems will require inspection and maintenance to ensure proper operation.

Drainage control systems are described in this section and are generally organized from east to west across the Site. Within each system, descriptions of structures are generally arranged from upgradient to downgradient. For each drainage structure described, reference is made to the As-Constructed Drawing in Appendix B that depicts the structure.

2.2.1 Knightsville Drainage Channel and Conduit

The Knightsville Drainage Channel is comprised of two sedimentation ponds that collect flows from the Chief Mill Site No. 1 Drainage Channel and the north-facing slopes of Godiva Mountain, which includes the May Day/Godiva Mine Waste Piles. The surface runoff collected in the two sedimentation ponds are discharged into a 48-inch culvert and conveyed to an open channel, i.e., Upper Eureka Gulch north of Hwy 6. The drainage system is designed for the 100-year storm. The purpose of the sedimentation ponds is to allow potentially contaminated sediments to settle out during runoff events prior to the water discharging downstream. See Appendix B-4, Drawings AC2-27 and AC2-28 for the As-Constructed Plans of the Knightsville Drainage Channel.

The following paragraphs provide a description of each portion of the Knightsville Drainage Channel that requires inspection.

2.2.1.1 Sedimentation Ponds and Culverts

2.2.1.1.1 Sedimentation Pond KC-1

Sedimentation Pond KC-1 collects drainage from the north slope of Godiva Mountain, including the May Day/Godiva Mine Waste Piles, and drainage along Knightsville Road. The pond is riprap lined, underlain by 12 ounce geotextile, and has a staff gauge to indicate the level of sediment that has been deposited. The constructed embankment is also lined with a geosynthetic clay liner to prevent seepage. The sedimentation pond is designed for the 100-year storm event; however, the pond is only designed to contain 12 inches of sediment before removal is necessary. If more than 12 inches of sediment is allowed to remain in the pond after a storm event, the pond will not contain the next 100-year storm event. See As-Constructed Drawings AC2-27a and AC2-27b in

Appendix B-4 for as-constructed cross sections of Sedimentation Pond KC-1. Drawing AC2-27d in Appendix B-4 displays an as-constructed profile of the channel upstream of Sedimentation Pond KC-1. Drawing AC2-27e in Appendix B-4 displays as-constructed cross sections of the channel upstream of Sedimentation Pond KC-1.

2.2.1.1.2 KC-1 Drainage Outlet

The discharge from Sedimentation Pond KC-1 flows into Sedimentation Pond KC-2 through an open channel. The channel crosses the Chief Mine No. 2 Access Road through a depression, or dip, in the road, referred to as a "Texas Crossing". Drawing AC2-27d in Appendix B-4 displays an as-constructed profile of the channel upstream of Sedimentation Pond KC-2. Drawings AC2-27f, AC2-27g and AC2-27h in Appendix B-4 display as-constructed cross sections of the channel upstream of Sedimentation Pond KC-2.

2.2.1.1.3 Sedimentation Pond KC-2

Sedimentation Pond KC-2 collects any overflow from sedimentation pond KC-1 as well as flow from the Chief Mill Site No. 1 Drainage Channel to the west. This pond is riprap lined and has a staff gauge to indicate the level of sediment that has been deposited. The sedimentation pond has an outlet to the 48-inch culvert designed to discharge a 100-year storm event. The sedimentation pond is designed to allow for 12 inches of sediment before removal is necessary. See As-Constructed Drawing AC2-27c in Appendix B-4 for as-constructed cross sections of Sedimentation Pond KC-2.

2.2.1.1.4 48-Inch Storm Drain Culvert

The 48-inch HDPE storm drain culvert conveys flows from Sedimentation Pond KC-2 and discharges to an open channel on the north side of Hwy 6, which flows into Upper Eureka Gulch. The culvert will has 5 manholes as well as an inlet structure at Sedimentation Pond KC-2.

2.2.2 Chief Mill Site No. 1 Drainage Channel

The purpose of the Chief Mill Site No. 1 Drainage Channel is to collect runoff from the open lands south of the Chief Mill Site No. 1 Access Road, which are not remediated, and direct it towards the Knightsville sedimentation pond. In addition, the drainage channel will capture surface runoff from both the Chief Mine No. 2 Mine Waste Pile and Chief Mill Site No. 1, which will be capped. The channel is designed to contain a 100-year storm event and will be riprap lined. The channel will flow eastward to a sedimentation pond in the Knightsville Drainage Channel. Because the open lands south of the channel will not be remediated as part of the remedial action, any surface runoff from this area would be considered potentially contaminated even though surface runoff from the capped mine waste areas should be free of contaminants. See Appendix B-10, Drawings AC2-8, AC2-9 and AC2-10 for the As-Constructed Plans of the Chief Mill Site No. 1 Drainage Channel.

2.2.3 Upper Eureka Gulch Drainage

The headwater of Eureka Gulch is an open channel west of the Tintic High School parking lot that flows to Spring Street. Eureka Gulch then flows through a series of lined ditches and culverts through the residential portion of Eureka and empties into an open channel at the west side of the parking lot at City Hall on Church Street. The channel flows through the Gemini & Bullion Beck Mine Waste Piles site and continues to flow west out of Eureka. Upper Eureka Gulch Drainage is that part of Eureka Gulch upstream of Spring Street. The channel is riprap lined with an underlay of geotextile. See Appendix B-12, Drawing AC2-12 for the As-Constructed Plan of Upper Eureka Gulch Drainage Channel.

2.2.3.1 UEG-1 (A and B)

Culverts UEG-1 (A and B) convey drainage from the Knightsville Drainage Channel to the south and the High School Drainage to the north under Bulk Plant Road. The crossing consists of two 24-inch HDPE pipes with flared ends on the upstream end. Facing upstream, culvert A is on the right and culvert B is on the left. These culverts are designed to pass the 25-year storm event. Larger flows will flow over Bulk Plant Road and re-enter the open channel.

2.2.4 Gardner Canyon Drainage Channel

The Gardner Canyon Drainage Channel is located on the west side of Chief Mill Site No.1. Three sedimentation ponds are constructed along the channel. The flows in Gardner Canyon are considered contaminated due to the contamination of the open lands upgradient of the Chief Mill Site No.1 Access Road. This area will not be remediated because the area is heavily vegetated. The detention basins were sized to limit the height of the berms to 8.0 feet so as not to create a dam, as defined by State of Utah Regulations. To maximize the benefit to the downstream system, the ponds were made as large as the existing land area would allow. These ponds retain the 25-year storm event. The ponds were not extended to contain the 100-year storm event because this would have required the detention ponds to be regulated as dams. See Appendix B-10, Drawing AC2-8 for the As-Constructed Plan of the Gardner Canyon Drainage Channel.

Because of the Gardner Canyon terrain, the need to avoid creating dams, and the lack of any existing means to convey flood waters from Gardner Canyon through town, the Gardner Canyon Drainage Channel and sediment pond will not prevent flooding downstream during large storm events – it simply outlets into existing drainage areas. However, the structures will lessen flood flows during 25 year storm events and smaller storms.

2.2.4.1 Sedimentation Pond GC-1

Sedimentation Pond GC-1 is located upslope of Chief Mill Site No.1 Access Road and to the southwest of Chief Mill Site No.1. This sedimentation pond is riprap lined. Sedimentation Pond GC-1 discharges directly into Sedimentation Pond GC-2 through the GC-1 Culvert.

2.2.4.2 GC-1 Culvert

The discharge for Sedimentation Pond GC-1 is through a 48-inch HDPE pipe with flared end sections on the upgradient end. The pipe is 34.22 feet long.

2.2.4.3 Sedimentation Pond GC-2

Sedimentation Pond GC-2 is the center pond, which discharges into Sedimentation Pond GC-3. The pond is located upstream of the Chief Mill Site No.1 Access Road and directly west of Chief Mill Site No.1. This sedimentation pond is riprap lined. Sedimentation Pond GC-2 discharges through the GC-2 Culvert into an open channel flow that empties into Sedimentation Pond GC-3.

2.2.4.4 GC-2 Culvert

The discharge for Sedimentation Pond GC-2 is through a 48-inch HDPE pipe with flared end sections on the upgradient end. The pipe is 42.95 feet long.

2.2.4.5 Sediment Pond GC-3

Sedimentation Pond GC-3 is located downslope of the Chief Mill Site No.1 Access Road and north of the west end of Chief Mill Site No.1. This sedimentation pond is riprap lined. The discharge of the pond is controlled by weir that empties into the natural drainage of Gardner Canyon. No culverts are required for this sedimentation pond.

2.2.5 Eagle Blue Bell Drainage Channel

The Eagle Blue Bell Drainage Channel consists of a riprap-lined channel and two culverts. The channel and culverts are designed to convey the 100-year storm event. This drainage channel will collect flows from Eagle Canyon, Eagle Blue Bell Mine Waste Pile, Chief Mine No.1 Waste Pile, Snowflake Mine Waste Pile, Eureka Hill Mine Waste Pile, the Open Cell Repository, and some open lands. See Appendix B-7, Drawings AC2-4 and AC2-6 for the As-Constructed Plans of the Eagle Blue Bell Drainage Channel.

2.2.5.1 EB-1 Culvert

A 54-inch RCP pipe with flared ends on the upstream end was installed at the location. This culvert allows flow in the Eagle Blue Bell Drainage Channel to pass under the Chief Mine No. 1 North Access Road. The culvert is sized to convey the 100-year storm event.

2.2.5.2 EB-2 Culvert

A 54-inch RCP pipe with flared ends was installed at this location. The culvert allows flow in the Eagle Blue Bell Drainage Channel to pass under Hwy 6. The culvert is designed to convey the 100-year storm event. EB-2 Culvert is 225 feet northeast of the Bullion Beck Mine Shaft.

2.2.5.3 EB-3 Culvert

This culvert is an 18 inch corrugated metal pipe (CMP) installed below the ATV path to convey low flows from the Eagle Blue Bell Drainage Channel into Lower Eureka Gulch. Flows in excess of the capacity of the 18" culvert will overtop the ATV path and enter Eureka Gulch.

2.2.6 McChrystal Drainage Channel

The McChrystal Drainage Channel extends from Railroad Street to Eureka Gulch and drains residential areas from north of Chief Mine #1and west of Eagle Street. McChrystal Drainage Channel starts at Railroad Street east of the intersection of Maccey Street and Railroad Street, crosses Dublin Street, and discharges into the lower section of Eureka Gulch at the intersection of McChrystal Street and Hwy 6. The channel is riprap lined, and culverts were constructed to cross Railroad Street and Highway 6. The channel and culverts are designed for a 100-year storm event. See Appendix B-13, Drawing AC2-2A for the As-Constructed Plan of the McChrystal Drainage Channel.

2.2.6.1 Culverts

The following paragraphs describe the culverts associated with McChrystal Drainage which were installed.

2.2.6.1.1 Railroad Street Culverts (MC-1 and MC-2)

Two culverts were installed across Railroad Street to drain residential property to the south. Each of the culverts is 18-inch HDPE pipe with flared end sections. The upstream end of Culvert MC-1 is located near the entrance to the house at 337 Railroad Street. The upstream end of Culvert MC-2 is located at the extreme western corner of the 337 Railroad Street property, approximately 100 feet southwest of the upstream end of Culvert MC-1. Each of the culverts empties into the upstream end of the McChrystal Drainage Channel.

2.2.6.1.2 MC-3 Culvert

The MC-3 Culvert is a 29" high by 43" wide corrugated metal squash pipe that conveys drainage below Highway 6 from McChrystal Drainage to Eureka Gulch. The pipe is 82.83 feet long. It crosses underneath Hwy 6 at the intersection of McChrystal Street and Highway 6.

2.2.7 Lower Eureka Gulch Drainage Channel

The Lower Eureka Gulch Drainage Channel is the part of Eureka Gulch west of the parking lot at the City Municipal Building. Adjacent to this drainage is an asphalt-paved ATV path that provides an off-road vehicle corridor to the west. In addition, the city waterline to the well and pump house west of Eureka and the city sewage line to the treatment facility west of Eureka are constructed roughly parallel to the Lower Eureka Gulch Drainage Channel. See Appendix B-1, Drawing AC2-1, AC2-2 and AC2-13 for the As-Constructed Plans of the Lower Eureka Gulch Drainage Channel.

2.2.7.1 CY-1 Culvert (A and B)

The CY-1 Culvert conveys flows below the new access road to the City Yard. The culvert consists of two 54-inch reinforced concrete pipes (RCPs) that are 109.45 feet long. Facing upstream, culvert A is on the right and culvert B is on the left.

2.3 Open Lands

Remedial actions for open lands consist of restricting access through installation and maintenance of fencing and the establishment of local institutional controls. Open Lands include the following:

a. Areas within the Eureka Mills Superfund Site that are outside of the residential areas of Eureka, are not currently being used for residential purposes, and have established vegetation.

b. Heavily vegetated areas on slopes adjacent to the Godiva Mine Waste Pile and around the Eagle Blue Bell, Snowflake, and Eureka Hill mine waste piles (mostly on the uphill, south side of these mine waste piles); south of Chief Mill Site No.1; and west of the Eureka Hill Mine Waste Pile.

c. The vegetated mountain slope between Bullion Beck Mill and the City Yard west of the Gemini Mine Waste Pile.

d. Eureka Gulch west of the City Yard and the Bullion Beck Mine Waste Pile in the area between the ATV path and where the Lower Eureka Gulch diverges from the path.

In addition, portions of private residential properties that are not used and maintained as yard space or driving/parking areas may also be considered Open Lands.

Open lands will be fenced and gated to control trespassers where appropriate. Refer to Figures 4 and 5 for a plan of the fences that have been installed or are planned for installation. Signs may be posted where appropriate stating “No Trespassing” and warning of the presence of high lead concentrations. See Appendix E, Map of Open Lands, for locations of open lands and descriptions of the restrictions for each area.

2.4 Major Access Roads

During the Remedial Action, several access roads were constructed and some existing roads were improved to provide haul routes to key portions of the Site. Access roads will remain following construction activities to allow maintenance of Remedial Action features, to allow access to the Open Cell Repository for future disposal of contaminated soils, and to provide a means of traversing open areas not remediated during the Remedial Action. Access to specific remediated mine waste sites or other Remedial Action features is addressed in the discussion above of each area or feature. All culverts under access roads are addressed either in Section 2.1, Capped Waste Sites, or Section 2.2, Drainage Control Systems. Figure 6 provides a map which highlights all roads requiring operation and maintenance.

Some access roads may become public roads, though access may be limited.

2.4.1 Open Cell Access Road

The Open Cell Access Road is from Hwy 6 west of Eureka to the south side of the Chief Mine No.1 Mine Waste Pile. This access road provides access to the Eureka Hill and Snowflake mine waste piles, the Open Cell, and the lower portion of the Eagle Blue Bell Mine Waste Pile. From this road, access can be gained to the top of Chief Mine No.1 Mine Waste Pile from the south side. The road continues to Eagle Street on the east side of Chief Mine No. 1. Gates along this access road control access to all mine waste sites. Although gated, the public will be allowed access to the Open Cell from this road via Hwy 6. The road is 24 feet wide and constructed of 12 inches of road base underlain by 8-ounce geotextile fabric.

2.4.2 Chief Mill Site No. 1 Access Road

The Chief Mill Site No. 1 Access Road starts at Knightsville Road and continues to the west past Chief Mill No. 1/Chief Mill Tailings, Chief Mill Site No. 1, through Gardner Canyon on the old railroad grade, to the intersection with the Eagle Blue Bell Haul Road. Historically, this access road was a railroad grade to the Eagle Blue Bell Mine. This access road will also provide a corridor for ATVs from Knightsville Road to the intersection with the asphalt ATV path that transects the Chief Mill No. 1/Chief Mill Tailings site. The road is 15 feet wide and constructed of 12 inches of road base underlain by 8-ounce geotextile fabric. See Appendix B-10, Drawing AC3-16 for the As-Constructed Plan of the Chief Mill Site No. 1 Access Road. Drawing AC3-16a in Appendix B-10 displays an as-constructed profile of Chief Mill Site No. 1 Access Road and Drawing AC3-16b displays as-constructed cross sections of Chief Mill Site No. 1 Access Road.

2.4.3 Knightsville Road

Knightsville Road is an existing county road maintained by the County on the east end of Eureka that heads south from Hwy 6 near Tintic High School. The road is 24 feet wide and has been capped with 12 inches of road base underlain by 8-ounce geotextile fabric from Hwy 6 to the intersection with the May Day/Godiva Access Road. See Appendix B-5, Drawing AC3-8 for the As-Constructed Plan of Knightsville Road. Drawing AC3-8a in Appendix B-5 displays an as-constructed profile of Knightsville Road and Drawings AC3-8b, AC3-8c, AC3-8d, and AC3-8e display as-constructed cross sections of Knightsville Road.

2.4.4 Realigned Knightsville Access Road

The northernmost 450 feet of Knightsville Road was realigned to the east across Hwy 6 from Tintic High School to accommodate the construction of the Knightsville sediment ponds and the intersection with the Chief Mill Site No.1 Access Road. A dedication plat was prepared for the County to designate the realigned road as right of way property, thus the realignment portion of the road is a county road which is also maintained by the County. The road is 30 feet wide and is constructed of 12 inches of road base underlain by 8-ounce geotextile fabric. See Appendix B-5, Drawing AC3-13 for the As-Constructed Plan of Realigned Knightsville Road. Drawing AC3-13a in Appendix B-5 displays an as-constructed profile of Realigned Knightsville Road and Drawing AC3-13b, displays as-constructed cross sections of Realigned Knightsville Road.

2.5 Residential Remediation

Operation and maintenance of privately owned residential and commercial properties will be the responsibility of the private owners. The local City Government is responsible for implementation of institutional controls which will contribute to the long term permanence of the residential remediation. The City of Eureka is in the process of reviewing an ordinance that will, when adopted, regulate land use and provide regulations and permitting procedures for excavations and residential development. A copy of the ordinance in draft form, entitled "City of Eureka, Utah Zoning Ordinance Chapter 13, Regulations and Permitting Procedures for Excavations and Development in the Eureka Mills Superfund Site" is provided in Appendix F.

The EPA has made available stockpiles of road base and topsoil to be used by residents to assist with long-term maintenance of the residential remediation. The material is located east of Eureka - refer to Figure 2 for the location of the stockpiles. Use of this material will be governed by requirements the City of Eureka zoning ordinance, a draft of which is provided in Appendix F.

3 HEALTH AND SAFETY

The entity performing operation and maintenance required by this O&M Manual will meet Occupational Safety and Health Administration (OSHA) requirements. Appendix A, Health and Safety Requirements, provides a guide that may be used during O&M activities for the health and safety of workers. Because requirements change over time, this Appendix should only be used as a guide. The entity performing operation and maintenance activities is required to meet current OSHA requirements.

4 INSPECTION AND MAINTENANCE REQUIREMENTS

4.1 Inspection Frequency

All mine waste sites (Remedial Action Structures (RAS)), the Open Cell Repository, drainages, drainage berms, sedimentation ponds, culverts, roads, and fenced open lands shall be inspected at least once per year during the Annual Inspection. Additional inspections may be performed as necessary due to rain event or earthquake, to respond to reports from local citizens, or to inspect maintenance activities. The following paragraphs describe required inspections.

4.1.1 Annual Inspections

Annual Inspections will be conducted by the party with responsibility for O&M for that RAS. The EPA and the State shall be notified of the inspection at least 30 days prior to its scheduled date and shall have the option of attending the Annual Inspection.

4.1.2 Bi-Annual Inspections

When bi-annual inspections (twice per year) for the Open Cell Repository are required, they maybe conducted by the party with responsibility for O&M. Bi-annual inspections may be needed when the Open Cell Repository is in operation, accepting contaminated soils from Eureka residents. After the Open Cell is closed, the State shall determine and notify the EPA of the frequency of inspections planned by the State. The State will notify the EPA of all regularly scheduled inspection at least 30 days prior to its scheduled date and EPA shall have the option of attending the Bi-annual Inspection.

4.1.3 5-Year Inspection

EPA and the State shall conduct a 5-Year Inspection of all mine waste sites, the Open Cell Repository, drainages, drainage berms, sedimentation ponds, culverts, roads, and fenced open lands. The 5-Year Inspection will be scheduled by EPA and, in addition to visual inspection, will include a review of records maintained by the City of Eureka and Juab County on the implementation of institutional controls (zoning and building ordinances). The 5-Year Inspection may include environmental sampling of areas of concern.

4.1.4 Significant Events Inspection

4.1.4.1 Significant Rain Event

Based on National Oceanic and Atmospheric Administration (NOAA) data and precipitation estimates, the 10-year storm event, 1-hour intensity would be about 0.70 inch per hour. Additionally, the independent trigger volume for a 10-year, 24-hour storm would be 1.9 inches. Either of these events will trigger an independent inspection. Due to the size of riprap and the caps, it is not expected that events smaller than these would generate significant runoff from the remediated sites. Hourly rainfall data from the weather station at Tintic High School can currently be obtained in three ways: 1) www.weatherbug.com provides real time information on current conditions and can be upgraded for a small cost to allow retrieval of up to four months of historical data; 2) www.classroom.aws.com/splash.asp, or; 3) directly

from the weather station via a database on a computer hooked up to the weather station at the high school. Access to the computer can be arranged with the school office and librarian.

4.1.4.2 Significant Earthquake

The design earthquake acceleration for the waste piles was selected as 0.4g, which corresponds roughly to a Richter Scale magnitude of 7.0. Based on the inherent uncertainty in predicting the response of earthen structures to earthquake shaking, the waste piles should be visually inspected if an earthquake magnitude of 5.0 or greater occurs within 25 miles of the Site. An earthquake with a magnitude of 5.0 or greater will likely be "felt" in Eureka. Information on earthquake magnitudes in Utah can be obtained from the University of Utah, Department of Geology and Geophysics (University of Utah Seismograph Stations), 135 South 1460 East, Room 705 WBB, Salt Lake City, Utah, 84112-0111, Phone 801-581-6274, Fax 801-585-5585. Additionally, information on earthquakes can be obtained online at http://www.seis.utah.edu/.

4.2 Schedule and Notification of Inspections

The Annual Inspections and 5-Year Inspections shall be scheduled during the month of May or June. The Bi-Annual Inspections for the Open Cell Repository shall be scheduled for April or May and October or November. There are several reasons to conduct the inspections as specified:

- By conducting the inspections as the same time each year, there is consistency in comparing any changes between years.
- If weeds become a problem, the best time to spray for weed control is in the spring before the weeds go to seed.
- Conducting inspections in the spring leaves plenty of time during the summer to make any necessary repairs noted during the inspection or to complete maintenance tasks prior to the onset of winter.

A written notice shall be provided to and received by the key recipients listed below 30 calendar days prior to an inspection date for the Annual Inspections and 5-Year Inspections to allow adequate time for scheduling. Notifications shall also be made to the key recipients with regard to inspections resulting from a significant rain event and/or a significant earthquake. The following key recipients should be notified of inspections:

U.S. Environmental Protection Agency
Region 8; EPR-SR
Ms. Paula Schmittdiel
Superfund Remedial Response Program
999 18th Street, Suite 300
Denver, Colorado 80202-2466
Office: (303) 312-6861
Fax: (303) 312-6897
Schmittdiel.Paula@epamail.epa.gov

State of Utah
Department of Environmental Quality (DEQ)
Mr. Michael Storck
168 North 1950 West
Salt Lake City, Utah 84116
Office: (801) 536-4179 or 4100
Fax: (801) 536-4242
mailto: mstorck@utah.gov

City of Eureka
Mayor
P.O. Box 156
Eureka, Utah 84628
Office: (435) 433-6915

4.3 Qualifications and Training of Inspectors

Qualified personnel will perform the Annual Inspection. Qualifications can be established either by experience or training in the proper inspection of cap systems and erosion control systems. At a minimum, personnel should have a high school diploma or equivalency (GED); at least two years of inspection experience in engineering, construction, or regulatory environment; and the ability to read and understand standards, maps, engineering drawings, and specifications.

Inspectors should spend a minimum of 8 hours training on the as-constructed drawings for the Eureka Mills Superfund Site and this O&M Manual prior to inspection of the Site. The training may be self-review.

4.4 Documentation and Reporting of Inspections

A record will be made of each formal inspection with the time and date and the system inspected. All inspection records will be signed and dated with required action to be taken clearly noted. Required actions may include routine maintenance items, such as repair of fencing, spraying for weeds, and road maintenance, or may be repair activities, such as repairing rock caps that may have been damaged from erosion or human activities. Forms have been prepared for the inspections and are provided in Appendix D. A total of 2 copies each shall be furnished to all "key recipients" identified in Section 4.2, above.

In addition to the inspection report, photos shall be provided depicting any conditions including, but not limited to, encroachment, intrusion, material degradation, obstructions in flow, noxious weeds, erosion, sloughing material, displaced material, signs of trespass, malfunctioning gates, damaged or missing signs, damaged or missing fence, and displacement of pipe. Reports of inspections shall be distributed within 10 workdays following any inspection.

4.4.1 Annual Inspection

The results of the Annual Inspection can result in a recommendation for maintenance. Maintenance may include periodic and routine activity as well as specific actions in response to identified deficiencies. The conditions of each waste pile, drainage feature, sedimentation pond, or Open Cell inspection will be documented in writing and

supplemented with photos. If maintenance is recommended as a result of an inspection, a follow-up to the inspection report will be provided to document that concerns raised during the inspection have been addressed through implementation of the suggested maintenance activity.

4.4.2 Bi-annual Inspections

Bi-annual inspections, if conducted, shall have the same documentation and reporting requirements as the Annual Inspections.

4.4.3 5-Year Inspection

Five-year inspections shall have the same documentation and reporting requirements as the Annual Inspections. In addition, the entity responsible for O&M shall provide to all of the "key recipients" listed in Section 4.2 copies of the inspection reports, maintenance reports and any other follow-up documentation generated since the previous 5-year inspection. This information shall be provided at least 4 weeks prior to the 5-year inspection.

4.4.4 Maintenance Inspections

Maintenance inspections refer to inspection of maintenance activities that have been performed. The inspection forms in Appendix D will be used to document inspections and routine maintenance activities conducted according to the requirements of this O&M Manual.

4.5 General Maintenance Activities

Maintenance refers to a broad range of activities that may or may not be required on a routine basis. In many cases, the required maintenance and care can only be defined based on the exact situation encountered. Any detected deterioration will be assessed as to the cause and extent of deterioration before repairs begin, and repairs will occur at the earliest possible time following detection. If something is found during an inspection in the future that appears to fall outside the scope of the O/M manual, the EPA and the State of Utah are to be notified to assess the findings. All maintenance and repairs will be documented. The following sections discuss potential maintenance and repairs that may be required.

4.5.1 Capping System

Repair of the capping system in damaged areas may include:

a. Replacing soils or geosynthetics by type

b. Proper compaction and/or patching of the cap and subgrade layers

c. Adding rock to the cap

d. Removal and repair of penetrations to the capping system

4.5.2 Slope and Grade

Maintenance of slope and grade may include:

a. Repairing erosion damage

b. Adding rock to the cap

4.5.3 Drainage Systems for the Site and Capped Waste Sites

Damaged erosion and drainage control structures need to be repaired, replaced, or restored to original conditions to prevent erosion (surface or subsurface) and ponding of water. When drainage structures become plugged or silt-filled, they will be cleaned. Drainage channels which have filled with silt above the elevation of the riprap will have silt removed to the top of the riprap to maintain drainage capacity.

4.5.4 Access Roads

Access roads will be regraded and road base added as needed to repair ruts and erosion, and to maintain accessibility. Knightsville Road and the re-aligned portion of Knightsville Road are county roads maintained by the County. Figure 6 shows the access roads requiring operation and maintenance. .

4.5.5 Fencing, Gates, and Signs

Fencing and gates installed shall be maintained to prevent uncontrolled access to potentially hazardous areas outside the limits of the remediation and to prevent trespassing in these areas.

Signs installed shall be maintained and replaced as weathering and vandalism diminishes the ability to recognize the warning statement.

4.5.6 Dust Control

Dust control shall be implemented during maintenance and repair of the remedy. The applications of chemical dust suppressants that may be used include magnesium chloride or calcium chloride or an acrylic polymer such as “EnviroTach.”

4.6 Summary of Inspections

Table 4-1 provides a summary of the inspections required by this O&M Manual

Table 4-1 – Summary of Inspection Requirements

Yearly Inspections		
#	**Component to be Inspected**	**Frequency**
1	Gemini Mine	Annual
2	Bullion Beck Mine	Annual
3	Bullion Beck Mill Site	Annual
4	Eureka City Yard	Annual
5	Eureka Hill Waste Rock	Annual
6	Chief Mill Site No. 1	Annual
7	Chief No. 1 Mill Tailings/Chief Mill No. 1	Annual
8	Chief Mine No. 2 and Access Road	Annual
9	Godiva Tunnel	Annual

Table 4-1 – Summary of inspection Requirements (Con’t)

Yearly Inspections		
	Component to be Inspected	**Frequency**
10	Godiva Shaft	Annual
11	May Day Mine and Access Road	Annual
12	Godiva/May Day Road	Annual
13	Chief Mine No. 1	Annual
14	Eagle Blue Bell Mine/ Transition/ Dump	Annual
15	Eagle Blue Bell Drainage Channel	Annual
16	Remediation Area Between Chief Mine #1, Snowflake, and Eureka Hill, Including Access Roads	Annual
17	Snowflake	Annual
18	Gardner Canyon Sediment Ponds & Drainage Channel	Annual
19	Chief Mill Site No. 1 Haul Road and Drainage Channel	Annual
20	McChrystal Drainage Channel	Annual
21	Open Cell	Annual[1]
22	Knightsville Road	Annual
23	Upper Eureka Gulch	Annual
24	Lower Eureka Gulch	Annual
25	Knightsville Drainage	Annual
Special Inspections - Entire Site		
26	Five Year Review	
27	Greater Than 10-year Rain Event	
28	Earthquake of 5.0 or greater on the Richter Scale occurs within 25 miles of the Site	

Note:
1. The Open Cell may be inspected twice/year if warranted during Open Cell operation – see Section 4.1.2.

5 INSPECTION AND MAINTENANCE REQUIREMENTS OF CAPPED WASTE SITES

Inspections of the capping system will include walking each completed cover system and looking for evidence of the following items:

5.1 Uncontrolled Access

Any evidence of damage to the cap resulting from vehicles, animal activities, or human disturbance will be noted, and repair of the damage will be performed as soon as practical after the damage has been found. Depending on the type and extent of damage, additional site access controls or changes in materials used for capping may be required.

5.2 Top and Slopes

The inspection will encompass the entire cap as well as side slopes. Inspection shall address differential settlement, subsidence, sloughing materials, erosion, and cracking due to slope movement. Signs of these elements during inspections include, but are not limited to, observation of pooled water, surface erosion, subsidence, depressions, raveling of aggregates at top of slopes with finer material remaining, accumulation of material inconsistent with grades at the bottom of slopes with gap graded rock and bulging at the mid-slope, obvious thickening and thinning of the rock cap surface that would be indicative of displacement, exposed underlying geotextile or base course, and deflections or unnatural breaks in the engineered grade.

Any repairs to the cap may require regrading and/or placement of additional riprap. If subsequent inspections reveal similar required repairs in the same location, a re-evaluation of the cap system in that area may be required. If it is evident that surface water flow is responsible for the damage to the cap, then diversion structures, realignment of the flow path, energy dissipation, or stilling basins may be required to correct the problem.

Areas adjacent to major slope transitions where the cap meets the native ground elevation will be inspected to ensure that erosion from combined sheet flow runoff is not occurring and that the underlying fine material is not migrating through the coarse rock cap.

Cutoff berms and energy dissipation dikes will be inspected for side-slope erosion and for any indication that surface water flow is bypassing, or shows the possibility of bypassing, the structure.

5.3 Welded Wire Retaining Wall

A welded wire retaining wall was constructed at the Gemini & Bullion Beck mine waste pile. The purpose of the inspection is to evaluate the fill surface in proximity to the welded wire wall and backfill for signs of settlement, horizontal movement, wall deformation, structural failure, erosion problems, and migration of fines through the face and at the toe section. In addition, the welded wire will be inspected for deformation and failure. Any problems identified during the inspection of the welded wire wall will be immediately evaluated by a qualified geotechnical engineer, and appropriate steps will be taken to correct any deficiencies.

5.4 Open Channel Drainage and Drainage Berms

Drainage berms and ditches which are a part of a RAS (for example, the Eureka Hill Drainage Channel) shall be inspected for differential settlement, subsidence, sloughing materials, erosion, displacement of rock, exposed geotextile, sediment, debris, overgrowth of vegetation, and overtop by drainage flows.

Drainages and berms that control and direct surface water flows shall be repaired as necessary to conform to the design criteria. A geotechnical engineer and/or hydrologist shall assess situations where repeated maintenance and repairs of the same locations are necessary.

Inspection of all channel side slopes, especially at channel bends, shall be performed to ascertain that the riprap integrity and slope profile have not been compromised and that bank cutting is not occurring. Any areas of displaced riprap, erosion at the transition points of the channel side slopes caused by surface flow entering the channel, or any areas of scour (erosion) will be repaired by regrading and the placement of additional riprap, if required.

All channels will be inspected for areas of excessive sedimentation that may indicate settlement or grading problems. Sediments will be removed from such areas, and the cause of the settlement will be addressed.

All drainages will be inspected for obstructions such as the presence of clogs or obstructions caused by sediments, vegetation or debris. All such obstructions will be immediately removed during the inspection if possible. If immediate removal is not possible, the location of the obstruction will be noted, and arrangements shall be made for the removal of the obstruction. Accumulated sediments caused by an obstruction should be disposed of in the Open Cell Repository unless sampling results show that it is not contaminated. Vegetative debris that accumulates due to an obstruction can be placed in the Open Cell. The obstruction itself and other non-vegetative debris (e.g., tires, logs, bikes, and cars) will be grossly decontaminated and then disposed of in an appropriate landfill.

5.5 Access Roads

Inspection of the surfaces of access roads at the capped waste sites will be documented. The purpose of the inspection is to identify differential settlement, subsidence, sloughing materials, erosion, exposed geotextile, and off-road traffic. All channel roadway crossings will be inspected to ensure that channel flow has not scoured the side slopes or road surface and that flow has not diverted from the channel onto the roadway.

5.6 ATV Trails

Inspection of the surfaces of ATV trails shall be documented. The purpose of the inspection is to identify differential settlement, subsidence, erosion, exposed geotextile, and evidence of deviation of traffic from the trail. Paved areas shall be inspected for raveling and missing pavement, surface sediments, cracking, and deterioration.

5.7 Culverts, Pipe, and Conduits

All culverts will be inspected for erosion around the inlet on the upstream side and for channel scour on the downstream side. Any erosion around the culvert will be repaired to prevent undercutting of the culvert or piping along the culvert. If downstream scour is noted, additional riprap will be placed. Excavation of a scour hole may be required prior to placement of additional riprap. Any excavated material shall be placed in the Open Cell Repository unless shown through representative sampling to contain lead concentrations below 231 mg/kg lead.

All culverts, pipe, and conduits, including inlets and outlets, will be inspected for the presence of obstructions such as sediments, vegetation, or debris. All such obstructions will be immediately removed. If immediate removal is not possible, the location of the obstruction will be noted and arrangements for removal will be made as soon as possible. Material causing the obstruction will be disposed of appropriately in either the Open Cell or in an appropriate landfill.

Differential settlement and misalignment of pipe joints are a hindrance to flow. Misaligned pipe joints shall be identified and repaired. Culverts shall be inspected for proper curvature. An engineer shall evaluate any compressions or deflections in the wall of culverts outside of round, and the cause shall be corrected. For concrete pipe, pipe should be inspected for corrosion, spalls, cracks, and fractures. For HDPE pipe, pipe should be inspected for cracks and fractures.

Flap gates or grates on storm drain outlets will be inspected for corrosion, damage, or other physical hindrances to normal operation. Adversely impacted gate hinges or damaged gates or grates that no longer function as designed will be replaced or repaired as necessary.

5.8 Fencing, Gates, and Signs

Fencing, gates, and signs will be inspected for damage, wear and tear, and vandalism. Fence damage includes, but is not limited to, broken or leaning posts, loose strands or mesh, out-of-alignment gates, and penetrations through the fence. Identified defects that impact operation of fences and gates shall be repaired. Signs that are missing or damaged to the extent that they are not serving the intended purpose shall be replaced.

5.9 Vegetation

Where vegetation caps are employed, the vegetation shall be inspected for adequacy of the cap.

Vegetation shall be removed from the drainages lined with armor or riprap to allow free flow of water and suspended soils during high flow events. If vegetation is obstructing surface water flow in the drainages, the vegetation should be removed. If a herbicide is used, the remaining vegetative mass above grade should be manually removed once the application of herbicides has taken effect.

Noxious weeds should not be allowed to interfere with the establishment of the vegetated cover. The owner of the property should control noxious weeds in accordance with Utah Code Ann. § 4-17-7 and other applicable law.

A current list of Utah State's noxious weeds is available from the Utah State University's website (http://www.extension.usu.edu/weedweb/nweeds/Utah.htm).

Applications of herbicides shall be applied by a licensed applicator. Spent herbicide containers will be disposed of appropriately. Disposal of spent herbicide containers in the Open Cell is not allowed.

6 INSPECTION AND MAINTENANCE REQUIREMENTS FOR SITE-WIDE DRAINAGES

Inspection and maintenance requirements for the drainages within the capped mine waste sites apply to the open channel drainages. In addition to the requirements that follow, the Knightsville Drainage Channel requires the inspection of the grated cover on inlet weir in sedimentation pond KC-2 and of the flap gate on the outlet of pipe on the north side of Hwy 6.

For consistency and ease of reference, the requirements for Open Channel Drainages are repeated below.

6.1 Open Channel Drainage

Open channel drainage of the site is designed for free flow of water. Drainage berms and ditches shall be inspected for differential settlement, subsidence, sloughing materials, erosion, displacement of rock, exposed geotextile, sediment, debris, over growth of vegetation, and overtop by drainage flows. Drainages and berms required to control and direct flows shall be repaired as necessary to design criteria. A geotechnical engineer and/or hydrologist shall assess situations where repeated maintenance and repairs of the same locations are necessary.

Inspection of all channel side slopes, especially at channel bends, shall be performed to ascertain that the riprap integrity and slope profile have not been compromised and that bank cutting is not occurring. Any areas of displaced riprap, erosion at the transition points of the channel side slopes caused by surface flow entering the channel, or any areas of scour (erosion) will be repaired by regrading and the placement of additional riprap, if required.

All channels will be inspected for areas of excessive sedimentation that may indicate settlement or grading problems. Sediments will be removed from such areas, and the cause of the settlement will be addressed.

All drainages will be inspected for obstructions such as the presence of clogs or obstructions caused by sediments, vegetation, or debris. All such obstructions will be immediately removed during the inspection if possible. If immediate removal is not possible, the location of the obstruction will be noted, and arrangements shall be made for the removal of the obstruction. Accumulated sediments caused by the obstruction should be disposed of in the Open Cell Repository unless sampling results show that it is not contaminated. Vegetative debris that accumulates due to the obstruction can be placed in the Open Cell. The obstruction itself and other non-vegetative debris (e.g., tires, logs, bikes, and cars) will be grossly decontaminated and then disposed of in an appropriate landfill.

6.2 Culverts, Pipe, and Conduits

All culverts will be inspected for erosion around the inlet on the upstream side and for channel scour on the downstream side. Any erosion around the culvert will be repaired to prevent undercutting of the culvert or piping along the culvert. If downstream scour is noted, additional riprap will be placed. Excavation of a scour hole may be required prior to placement of additional riprap. Any excavated material shall be placed in the Open Cell

unless shown through representative sampling to contain lead concentrations below 231 mg/kg lead.

All culverts, pipe, and conduits, including inlets and outlets, will be inspected for the presence of obstructions such as sediments, vegetation, or debris. All such obstructions will be immediately removed. If immediate removal is not possible, the location of the obstruction will be noted, and arrangements for removal will be made as soon as possible. Material causing the obstruction will be disposed of appropriately in either the Open Cell or in an appropriate landfill.

Differential settlement and misalignment of pipe joints are a hindrance to flow. Misaligned pipe joints shall be identified and repaired. Culverts shall be inspected for proper curvature. An engineer shall address any compressions or deflections of the wall of culverts outside of round, and the cause shall be corrected. Any corrosion, spalls, cracks, and fractures shall be addressed and repaired.

Flap gates or grates on storm drain outlets will be inspected for corrosion, damage, or other physical hindrances to normal operation. Adversely impacted gate hinges or damaged gates or grates that no longer function as designed will be replaced or repaired as necessary. Grated cover on inlet weir in Sedimentation Pond KC-1 and the flap gate on the outlet end of the Knightsville Drainage storm water culvert shall be kept in sound operating order.

Manholes shall be inspected to ensure that joints are properly aligned. Manhole covers shall be inspected to ensure that covers are properly seated and that removal is not hindered by corrosion.

All channels, culvert areas, and sediment pond inlets and outlets will be inspected for the presence of clogs or obstructions caused by sediments, vegetation, or debris. All such obstructions will be immediately removed during the inspection if possible. If immediate removal is not possible, the location of the obstruction will be noted, and arrangements for its removal will be made as soon as possible. Material causing the obstruction will be disposed of appropriately in either the Open Cell or in a municipal landfill.

All inspections of the storm drain system will be performed using confined space access techniques per the Site Safety and Health Plan for this task.

6.3 Sediment Ponds

The design is based on a specific capacity, and maintaining this capacity is crucial for proper operation. Staff gauges are installed in the basins to identify depth of sediment without the need for survey.

All sediment pond inlets and outfalls will be inspected to ensure that the integrity of the structure has not been compromised. Riprap on the pond berms will be inspected for any signs of failure or mass movement indicated by slope disruption, thickening or thinning of the riprap, or exposure of underlying geotextile or fill material.

Areas behind the sedimentation pond dams and outlet structures will be inspected for excessive sediment buildup. Once sediments reach a thickness of 12 inches based on the staff gauges, the sediments shall be removed and placed in the Open Cell.

6.4 Fencing, Gates, and Signs

Fencing, gates, and signs will be inspected for damage, wear and tear, and vandalism. Fence damage includes, but is not limited to, broken or leaning posts, loose strands or mesh, out-of-alignment gates, and penetrations through the fence. Damaged and missing signs shall be replaced. Additional signs shall be posted in all fenced areas damaged due to unauthorized intrusion. All identified defects will be repaired accordingly.

6.5 Vegetation

Where vegetation is necessary for the maintenance of the remedy, the vegetation shall be inspected for adequacy.

Vegetation shall be removed from the drainages as necessary to allow free flow of water and suspended soils during high flow events. If vegetation is obstructing surface water flow in the drainages, the vegetation should be removed. If a herbicide is used, the remaining vegetative mass above grade should be manually removed once the application of herbicides has taken effect.

Applications of herbicides shall be applied by a licensed applicator. Spent herbicide containers will be disposed of appropriately. Disposal of spent herbicide containers in the Open Cell is not allowed.

7 INSPECTION AND MAINTENANCE REQUIREMENTS FOR MAJOR ACCESS ROADS

The surface of major access roads to the capped sites shall be inspected. The purpose of the inspection is to identify differential settlement, subsidence, sloughing materials, erosion, exposed geotextile, and off-road traffic. In some locations, channels have been designed to cross over an access road through a depression, or dip, in the road. All channel crossings will be inspected to ensure that channel flow has not scoured the side slopes or road surface and that flow has not diverted from the channel onto the roadway. Knightsville Road and the re-aligned portion of Knightsville Road are county roads maintained by the County. Figure 6 shows the access road requiring operation and maintenance.

7.1 Culverts, Pipe, and Conduits

All inspections of culverts, pipe, and conduits are addressed in Section 5, Inspection and Maintenance Requirements of Capped Waste Sites, in Section 6, Inspection and Maintenance Requirements for Site-Wide Drainages, and in Section 8, Inspection, Operation, and Maintenance Requirements for the Open Cell.

7.2 Fencing, Gates, and Signs

Fencing, gates, and signs will be inspected for damage, wear and tear, and vandalism. Damage to fencing includes, but is not limited to, broken or leaning posts, loose strands or mesh, out-of-alignment gates, and penetrations through the fence. Damaged and missing signs shall be replaced. Additional signs shall be posted in all fenced areas damaged due to unauthorized intrusion. All identified defects will be repaired accordingly.

7.3 Vegetation

Where vegetation caps are employed, the vegetation shall be inspected for adequacy of the cap. Vegetation shall be removed from the drainages as necessary to allow free flow of water and suspended soils during high flow events. If vegetation is obstructing surface water flow in the drainages, the vegetation should be removed. If a herbicide is used, the remaining vegetative mass above grade should be manually removed once the application of herbicides has taken effect.

Applications of herbicides shall be applied by a licensed applicator. Spent herbicide containers will be disposed of appropriately. Disposal of spent herbicide containers in the Open Cell is not allowed.

8 INSPECTION, OPERATION, AND MAINTENANCE REQUIREMENTS FOR THE OPEN CELL

8.1 Description and Purpose of the Open Cell

An Open Cell Repository for disposal of lead-contaminated soil, for use by the community of Eureka, will be constructed as part of the Remedial Action. The Open Cell will be a controlled-access facility for future disposal of contaminated soils excavated after completion of the Remedial Action. Waste brought to the Open Cell will be limited to soil or mine tailings with lead concentrations above 231 mg/kg, which falls under the mining waste exemptions for land disposal. Impacted soils include, but are not limited to, development of properties within the Site boundaries from installation of utilities, basements, foundations, and landscaping. Note that soils from areas within the Site boundaries suspected of being contaminated may be placed in the Open Cell without testing.

The purpose for the Open Cell is to provide a regulated facility for the disposal of lead-contaminated soils that will provide residents and property owners in Eureka with a convenient and readily accessible place to take soils excavated from within the Superfund Site Boundaries. No other waste will be accepted at the Open Cell. **The Open Cell is not designed to accept wastes other than soil contaminated with lead or other heavy metals. Furthermore, the Open Cell is not authorized under the Utah Solid Waste Statutes and Regulations to accept wastes other than soil contaminated with lead or other heavy metals.**

Adjacent to the entrance road to the Open Cell is a concrete decontamination station to be used to remove soils, which may contain elevated lead concentrations, from the exterior of the vehicle, in particular, the wheels or tracks. Prior to exiting the Open Cell, the decontamination station is to be filled with water to a depth of approximately 2 feet. A water hydrant connected to the City of Eureka public water supply system is available for filling the decontamination station. The decontamination station should be used every time a vehicle exits the Open Cell regardless of personal observations or opinions. The effectiveness of the decontamination station may be improved by stopping approximately 3/4 of the way through, backing up a short distance and then proceeding through. A visual inspection should be performed after driving through the decontamination station to assure that no visible soils remain on the vehicle. Additional decontamination efforts can be accomplished by spraying with the hose connected to the water hydrant. The decontamination station should be drained at the end of each day. During periods of light use, the water may be left in the decontamination station for a few days, but never for more than one week. During periods of the year when temperatures below freezing are possible, the decontamination water should be drained daily.

The water from the decontamination station drains to the Eagle Bluebell Drainage Channel north of the Open Cell. The drain is controlled by a hand operated gate valve located at the northeast corner of the decontamination station.

A drainage pipe is located on the west side of the Open Cell to drain storm water. The drainage pipe consists of a 24 inch diameter solid corrugated HDPE which was constructed through the Open Cell berm and a section of 24 inch diameter vertically orientated perforated

HDPE inlet pipe inside the cell. The solid pipe outlets into the riprap-lined drainage channel at the western edge of the Open Cell.

Four brightly colored or flagged posts shall be placed and maintained around the inlet in a 5' by 5' square to deter damage to the inlet pipe or blockage of drainage path.

8.2 Requirements for Operation of the Open Cell

All workers at the Open Cell should be familiar with the operating requirements of this O&M Manual.

8.2.1 Placement of Contaminated Soils

Truck loads of contaminated soils disposed in the Open Cell shall be dumped into rows spaced 6-8 feet apart to facilitate grading and compaction. Generally, the floor of the Open Cell shall be graded to promote drainage to the west, toward the drain pipe located on the western side of the Open Cell. To achieve this, the elevation of the floor on the eastern side of the Open Cell should be kept proximately three feet above the elevation of the floor on the western side.

The contaminated soils disposed of in the Open Cell must be adequately compacted to ensure that the waste will ultimately support the engineered cover. Contaminated soil shall be placed in loose lift thicknesses of not more than 12 inches and compacted. Disposed soils shall be track walked with a Caterpillar D6 class bulldozer or with equipment which exerts similar ground pressure (7-10 pounds per square inch) to achieve desired compaction. If the disposed soils are relatively dry, water should be sprayed onto the soils to facilitate compaction. A minimum of three passes is required with an acceptance criterion of no soft areas. Dust shall be minimized by water spray during grading and compaction activities.

As soils are disposed on the Open Cell, placement should facilitate drainage to the drainage pipe located on the western side of the Open Cell. Periodically, the operator will need to extend upward the perforated HDPE. The pipe should be wrapped in 12 ounce geotextile fabric (see Appendix C-8) and/or be bedded in 12 inches of granular filter material to minimize the passing of material through the pipe perforations. The extension should be timed and constructed to minimize the vertical height of unsupported pipe to less than 5 feet.

8.2.2 Interim Cover

All waste placed in the Open Cell shall be covered with an interim cover placed in late fall of each year. The preferred method of providing interim cover shall consist of placing hydromulch over the contaminated soils placed in the Open Cell. The hydromulch cover shall be placed at a rate of 2,500 lbs hydromulch/acre with 35 - 40 ounces of tacifier per acre. As an alternative, a 3 to 6 inch thick compacted layer of uncontaminated select fill (see Appendix C-7 for select fill material specifications) may be used. Interim soil cover, if used, shall be moisture conditioned and track walked with a Caterpillar D6 class bulldozer or with equipment which exerts similar ground pressure (7-10 pounds per square inch) to achieve desired compaction. A minimum of three passes is required with an acceptance criterion of no soft areas. Dust shall be minimized by water spray during grading and compaction activities.

Hydromulch is the preferred method of placing interim cover because it does not use space in the Open Cell, will be less expensive than placing cover soil, and will conserve the stockpile of topsoil provided to the City of Eureka to assist with the administration of the proposed excavation ordinance (see Appendix F).

8.2.3 Closure of Open Cell

The State shall decide when it is appropriate to close the Open Cell. The purpose of closure is to provide a permanent vegetative cover to prevent wind blown erosion of the contaminated soils and to minimize runoff from the Open Cell.

Closure shall consist of grading the final lift of contaminated soils to be erosionally stable and then hydroseeding to establish a vegetative cover. Closure in this manner has been determined by UDEQ to meet State of Utah Landfilling Standards (UAC R315-303-3(4)), provided that the final lift of contaminated soils is sufficient to sustain vegetation. EPA concurred with the State's determination on October 1, 2008 because the proposed design change meets the State's closure requirements and will be protective of human health and the environment.

Seed used for the vegetative cover shall be drought tolerant (use the non-residential mix) and be applied in the fall of the year. Where appropriate, as determined by the State, erosion mat shall be used to prevent erosion of the cap prior to establishment of the vegetative cover. The erosion mat shall be designed to provide up to 12 months of erosion protection and installed in accordance with manufacturer requirements. Refer to Appendix C for material specifications for the select fill, topsoil, and seed. The final cover shall be constructed with a crown roughly in the middle of the Open Cell, sloping at a 3-5% grade to the edges of the Open Cell. The slopes shall be uniformly graded to promote sheet flow from the cap.

8.3 Inspection and Maintenance Requirements for the Open Cell

8.3.1 Embankment

The embankment of the Open Cell, including the constructed side slopes and cover, shall be inspected. The purpose of the inspection is to identify differential settlement, subsidence, sloughing materials, erosion, and cracking due to slope movement. Signs of these elements during inspections include, but are not limited to, observation of pooled water, surface erosion, subsidence, depressions, raveling of rock cap at top of slopes with finer material remaining, accumulation of material inconsistent with grades at the bottom of slopes with gap graded rock and bulging at the mid-slope, obvious thickening and thinning of the rock cap surface that would be indicative of cap displacement, exposed underlying geotextile or base course, and deflections or unnatural breaks in the engineered grade.

Any repairs to the cap system may require regrading and/or placement of additional riprap. A re-evaluation of the cover system may be required if subsequent inspections reveal similar required repairs in the same location. If it is evident that surface water flow is causing the damage to the cap, then diversion structures, realignment of the flow path, energy dissipation, or stilling basins may be required to correct the problem.

Areas adjacent to major slope transitions where the cap meets the native ground elevation shall be inspected to ensure that erosion from combined sheet flow runoff is not occurring and that the underlying fine material is not migrating through the coarse rock cap.

Cutoff berms and energy dissipation dikes will be inspected for side slope erosion and for any indications that surface water flow is bypassing, or shows the possibility of bypassing, the structure.

8.3.2 Open Channel Drainage and Drainage Berms

Drainage berms and ditches shall be inspected for differential settlement, subsidence, sloughing materials, erosion, displacement of rock, exposed geotextile, sediment, debris, overgrowth of vegetation, and overtop by drainage flows. Drainages and berms required to control and direct flows shall be repaired as necessary to design criteria. A geotechnical engineer and/or hydrologist shall assess situations where repeated maintenance and repairs of the same locations are necessary.

Inspection of all channel side slopes, especially at channel bends, shall be performed to ascertain that the riprap integrity and slope profile have not been compromised and that bank cutting is not occurring. Any areas of displaced riprap, erosion at the transition points of the channel side slopes caused by surface flow entering the channel, or any areas of scour (erosion) will be repaired by regrading and the placement of additional riprap, if required.

All channels will be inspected for areas of excessive sedimentation that may indicate settlement or grading problems. Sediments will be removed from such areas, and the cause of the settlement will be addressed.

All drainages will be inspected for obstructions such as the presence of clogs or obstructions caused by sediments, vegetation, or debris. All such obstructions will be immediately removed during the inspection if possible. If immediate removal is not possible, the location of the obstruction will be noted, and arrangements shall be made for the removal of the obstruction. Accumulated sediments caused by the obstruction should be disposed of in the Open Cell unless sampling results show that it is not contaminated. Vegetative debris that accumulates due to the obstruction can be placed in the Open Cell. The obstruction itself and other non-vegetative debris (e.g., tires, logs, bikes, and cars) will be grossly decontaminated and then disposed of in an appropriate landfill.

8.3.3 Access Roads

The surfaces of the Open Cell Access Road will be inspected. The purpose of the inspection is to identify differential settlement, subsidence, sloughing materials, erosion, exposed geotextile, and off-road traffic. All channel roadway crossings will be inspected to ensure that channel flow has not scoured the side slopes or road surface and that flow has not diverted from the channel onto the roadway.

8.3.4 Culverts, Pipe, and Conduits

All culverts will be inspected for erosion around the inlet on the upstream side and for channel scour on the downstream side. Any erosion around the culvert will be repaired to prevent undercutting of the culvert or piping along the culvert. If downstream scour is noted, additional riprap will be placed. Excavation of a scour hole may be required prior to placement of additional riprap. Any excavated material shall be placed in the Open Cell.

All culverts, pipe, and conduits, including inlets and outlets, will be inspected for the presence of obstructions such as sediments, vegetation, or debris. All such obstructions will be immediately removed. If immediate removal is not possible, the location of the obstruction will be noted, and arrangements for removal will be made as soon as possible. Material causing the obstruction will be disposed of appropriately in either the Open Cell or in a municipal landfill.

Differential settlement and misalignment of pipe joints are a hindrance to flow. Misaligned pipe joints shall be identified and repaired. Culverts shall be inspected for proper curvature. An engineer shall address any compressions or deflections of the wall of culverts outside of round, and the cause shall be corrected. Any corrosion, spalls, cracks, and fractures shall be assessed and repaired.

8.3.5 Fencing, Gates, and Signs

Fencing, gates, and signs will be inspected for damage, wear and tear, and vandalism. Fence damage includes, but is not limited to, broken or leaning posts, loose strands or mesh, out-of-alignment gates, and penetrations through the fence. Damaged and missing signs shall be replaced. Additional signs shall be posted in all fenced areas damaged due to unauthorized intrusion. All identified defects will be repaired accordingly.

8.3.6 Vegetation

Where vegetation caps are employed, the vegetation shall be inspected for adequacy of the cap. Vegetation shall be removed from the drainages as necessary to allow free flow of water and suspended soils during high flow events. If vegetation is obstructing surface water flow in the drainages, the vegetation should be removed. If a herbicide is used, the remaining vegetative mass above grade should be manually removed once the application of herbicides has taken effect.

Applications of herbicides shall be applied by a licensed applicator. Spent herbicide containers will be disposed of appropriately. Disposal of spent herbicide containers in the Open Cell is not allowed.

9 MATERIAL SPECIFICATIONS FOR OPERATION & MAINTENANCE

Specifications for all materials used for the Remedial Action are provided in Appendix C, Material Specifications. In addition to these specifications, placement requirements are also addressed as per the design and as-constructed drawings as provided in Appendix B. These specifications shall be used for "like" materials that may be required for future maintenance and repairs.

FIGURES

APPENDIX A – HEALTH AND SAFETY REQUIREMENTS

HEALTH AND SAFETY REQUIREMENTS

The possibility of hazards exists with any future activities associated with the maintenance of the waste piles and the Knightsville drainage conduit piping system ("Site"). These are addressed below.

> Note: It must be emphasized that while every effort was made to present herein all reasonably anticipated hazards associated with the maintenance of the waste piles and pond outfalls, this Guidance may need to be amended over time if new hazards are encountered and when health and safety requirement are revised. All applicable federal, state and/or local safety and health regulations, including those promulgated by the Occupational Safety and Health Administration (OSHA), as enforced by the state of Utah, shall be complied with during the Site functions covered by this O&M Manual.

A. WASTE PILE MAINTENANCE

It is anticipated that personnel shall make planned visits to the Site, to conduct inspection and maintenance activities. During these visits, personnel may be exposed to slip/trip/falls, exposure to moving equipment, biological or physical hazards. To safely perform the required observation and/or maintenance duties, Site personnel shall adhere to, at a minimum, the following:

1. Slip/Trip/Falls – The terrain leading to, and surrounding, the piles is undeveloped and uneven, and can result in workers slipping, tripping or turning an ankle. To prevent these potentially injury-inducing accidents, the following preventative actions should be taken:

- Over-the-ankle leather boots are recommended. This not only minimizes the risk of serious ankle sprain, it also provides protection from most poisonous snakebites as well as lacerations from sharp low-lying or hidden debris.
- Look before you walk – scan the ground to be trod for loose debris, stones, holes, depressions, etc.
- Do not carry sharp object in clothing pockets – these could cause serious puncture injuries if a fall occurs.
- It is recommended to never run. Running lengthens stride, increases pressure on the foot/ankle, and reduces stability due to center-of-gravity displacement -all precursors for an accident.
- Wet/Winter/icy Conditions present additional slip/trip hazards – snow hides surface irregularities, and water infiltration softens supporting surfaces. Shorten stride when walking around piles in wet or snowy conditions. Avoid visiting Site when ice is present.

2. Working Around Moving Equipment – Active earth moving operations using mobile equipment such as scrapers, dozers, backhoes or trucks will present a hazard to personnel working in the area. Implement the following actions:

- If moving through an area with active equipment, announce your presence by making direct eye contact with the equipment operator prior to moving around the equipment.

- Watch your feet! Small movements by equipment can result in crushing hazards to the feet – if this is possible, wear protective-toed boots in compliance with the American National Standard Institute (ANSI) Z41.1 standard on safety-toed footwear.

- Be especially careful when walking or standing behind mobile equipment. Most operators have a blind spot in the rear of these equipment types.

- Always wear a standard traditional orange "traffic vest" when in proximity to moving equipment, as an aid in visual recognition.

- Equipment movement takes precedence over pedestrian foot traffic – wait until the operator gives you an "all clear" before crossing his/her path.

- If cranes are used on site, realize that their superstructure (crane cab) can and will rotate suddenly - stay clear of the area within the cab's "swing radius".

3. Biological Hazards – Site biological hazards may include snakes, spiders, ticks, mites, insects, noxious plants or feral mammals. To avoid injury or illness from these agents, the following guidelines are recommended:

- Do not wear perfumes or colognes, as they attract stinging insects.

- If necessary for mosquitoes or ticks, application of an insect repellent containing N,N-diethyltoluamide (DEET) is recommended, unless a person is allergic to this chemical.

- Wear protective clothing (long sleeves, long pants, and hat).

- If possible, avoid site visits at dawn and dusk, the periods when mosquitoes are most active.

- Watch for bee/wasp activity, a sign of a nearby nest.

- Wear protective light-colored clothing so ticks can be spotted on your clothing. Long sleeve shirts that fit tightly around the wrist, and long-legged pants tucked into stockings or boots are recommended.

- Always check for ticks on and under clothing after working in tick-infested areas. A daily total-body skin inspection greatly reduces the risk of infection since ticks may take several hours to two days to attach to the skin.

- If ticks are found attached on your body, take the following actions:

  1. Carefully remove ticks found attached to the skin. It is recommended to gently use tweezers to grasp head and mouth parts of the tick close to the skin as possible. Pull slowly to remove the whole tick. Try not to squash or crush them since this can squeeze ingested blood, contaminated with disease agents, back into your body.
  2. Wash affected area with soap and water or disinfect after removing ticks. This minimizes the possibility of having the puncture infected from tick excrement, which is known to harbor disease agents.

- **Leave snakes alone**. Many people are bitten because they try to kill a snake or get a closer look at it. Also, some species are protected by law.
- Stay out of tall grass unless you wear thick leather boots, and remain on hiking paths as much as possible.
- Keep hands and feet out of areas you can't see.
- If turning over/removing rocks or logs, always grasp from the farthest side and lift/pull towards your body, thus shielding yourself from any snake hiding beneath.
- Be cautious and alert around rocks, especially during early spring and fall, as venomous snakes will be moving to or from communal den sites, and their local densities around these favored areas may be quite high.
- If you encounter a snake when working, just walk around the snake. Give it a little berth, six feet is plenty, leave it alone and don't try to catch it.
- Site workers may encounter feral mammals (e.g., "wild" dogs & cats). Do not feed, chase, act threatening or call to these animals, or try to pet them. These animals should be left alone unless they interfere with site activities or act in an unusual or threatening manner; in this case, back away from the immediate area while facing the animal. **Feral dogs can become pack oriented, very aggressive, and represent serious risk of harm to unprotected workers**. Avoidance and protection protocols include watching for animal dens, using good housekeeping to discourage foraging, and using any of three types of repellents - visual-wear bright clothing; audio-announce your approach or presence with loud whistling, talking, radios, etc., and chemical – over-the-counter mace, pepper spray.
- Mammal-transmitted diseases include rabies and Hantavirus.
- All animals **do not** behave in the same manner when they have rabies.
    1. Foxes and skunks may lose their shyness and fear of people, pets, or livestock. Back away from any wild mammal that is acting unafraid.
    2. Cats can often become extremely vicious.
    3. Dogs usually become excitable, wander aimlessly, and may be vicious and bite for no reason.
- If an animal is threatening and dangerous and cannot be scared away, or is suspected of having rabies, withdraw, call 911, requesting the local police or animal control personnel, and continue to observe its movements (if possible).
- To avoid coming into contact with Hantavirus, avoid rodents and their burrows, or disturbing dens (such as rat nests).
- Noxious plants, such as poison ivy/oak may invade the Site and become established. Species identification and avoidance is the only truly effective preventative. If poison ivy/oak is native to the area, all field personnel should learn to recognize it by sight. Additionally, personnel should wear long pants, long sleeves, and gloves to minimize the possibility of exposure. **There are also barrier creams that, when applied to the exposed skin, offer good protection for a limited time, and have been used by field personnel with success**.

4. Chemical Hazards – It is anticipated that maintenance of the waste piles may necessitate the application of herbicides and/or insecticides. It is planned that, if used, these chemicals shall be of the over-the-counter quantities and formulations available for sale to, and use by, the general public. In this case, application of these chemicals does not require special applicator

training or licensure, nor do they fall under the OSHA Hazard Communication standard, 29 CFR 1910.1200. Nevertheless, at time of purchase, a Material Safety Data Sheet (MSDS) specific to that formulation shall be acquired, and the applicator shall read, understand and apply the chemical in accordance with the information presented on the label and the MSDS. All required personal protective equipment (PPE) specified by the label/MSDS shall be worn; at a minimum, the following is required:

- Tight fitting goggles
- Impermeable gauntleted (mid-forearm) gloves
- Disposable outer body coverall (e.g., Tyvek™ or equivalent)

Immediately upon cessation of application, the applicator shall doff the PPE and wash hands, face and any body parts that came into contact with the chemicals.

- If herbicides or insecticides with stronger formulations ("regulated pesticides") are used, whose use is regulated by any federal, state or local regulation, all required training, certifications or licensing shall be met prior to use. Label instructions shall be followed at all times. If regulated pesticides are used, their corresponding MSDS shall be acquired and permanently maintained, along with a written description of the date, time, quantity applied, PPE worn, location of usage, person(s) applying, and copies of any applicator license required.
- As a general rule, no chemical shall be applied if the ambient weather conditions are not favorable – e.g., high winds, wet/soggy/snowy conditions, impending inclement weather, or critical nesting periods of sensitive ecological receptor species, as known.

5. Physical Hazards – Potential physical hazards at the Site include extreme hot and cold air temperatures that can affect workers at the Site. These are addressed below.

(a) Heat Stress – Summer visitation can expose workers to high temperatures. While it is not anticipated that prolonged Site activities or intensive work shall occur that would predispose a worker to incurring a heat induced illness, the following information is presented to provide appropriate preparation if workers must perform Site activities during periods of high heat/humidity.

Types of Heat-Induced Illness:

- **Heat Rash (Prickly Heat).** Heat rash is a painful temporary condition caused by clogged sweat pores, and may result from continuous exposure to heat or humid air.
- **Heat Cramps.** Heat cramps are characterized by painful intermittent spasms of the voluntary muscles following hard physical work in a hot environment. The cramps are caused by a loss of electrolytes, principally salt. Treatment consists of increased ingestion of commercially available electrolytic "sports" drinks (dilute the concentration with extra water).
- **Heat Exhaustion** This condition is characterized by profuse sweating, weakness, low blood pressure, rapid pulse, dizziness, and frequently nausea and/or headache. The skin is cool and clammy, and appears pale. The body core temperature is normal or depressed. Victim may faint and/or vomit. First aid consists of placing the victim in a cool area, loosen clothing, place in a head-low (shock prevention) position, and provide rest

and plenty of fluids. This is the most common form of serious heat illness encountered during employment activities. Any worker who is a victim of heat exhaustion should not be exposed to a hot working environment for an absolute minimum of 24 hours, and if fainting has occurred, the victim should not return to work until authorized by a physician.

- **Heat Stroke** This is the most serious heat disorder, and is life threatening. Heat stroke results when the body's heat dissipating system is overwhelmed and shuts down, resulting in a continual rise in the victim's deep core body temperature. The symptoms are hot, dry, flushed skin, convulsions, delirium, unconsciousness, and possibly, death. First aid consists of immediately moving the victim to a cool area; immersion of the victim in cool (not cold) water or sponging the body with cool water; and treatment for shock if necessary. Call 911 for emergency medical assistance immediately: treatment response time is critical when assisting a victim of heat stroke! Do not give coffee, tea or alcoholic beverages.
- In order to prevent the onset of these heat-related disorders, Site workers should practice good health measures, such as:
    1. Maximize daily fluid intake and realize that thirst is not an adequate indicator of sweat loss. Water or other non-alcoholic beverages should be consumed every time the employee exits from the work area. The beverages should be cool (50° to 60° F), and readily available.
    2. The workers should be as physically fit as possible.
    3. Take rests in areas shaded from the sun, and cool (air-conditioned if possible).
- Realize that older workers are at a disadvantage in hot environments because the aging process results in a sluggish response of sweat glands, resulting in a less effective control of body temperature.
- **A victim of a heat-related disorder is permanently predisposed to suffering a recurrence.**
- Since every worker is unique in his/her ability to handle heat, work/rest periods should be adapted to an individual's capacity to safely handle the heat, not on a predetermined or inflexible time length.

(b) Cold Stress – It is much more likely that Site workers incur a cold-induced illness than a heat disorder, as cold stress can occur very rapidly in winter conditions in Utah. The following preventative steps should be followed during periods of cold weather, especially when combined with high winds and/or precipitation.

Types of Cold-Induced Illness:

- **Hypothermia**. This is a reduction in core body temperature. Workers core body temperature should generally not be allowed to fall below 96.8° F. At this point, severe shivering usually occurs. If the body core temperature drops below 95° F, the victim cannot produce enough body heat to recover. When this occurs, a medical emergency exists and medical attention should be summoned. Immediately treat the victim, since untreated hypothermia can lead to heart attack and death. Remove the victim to a warm area out of any wind. All cold and/or wet clothing should be removed, and the victim should be wrapped in warm blankets. If conscious and able to converse, they may be given warm (non-caffeinated, non-alcoholic) liquids, and foods high in carbohydrates. Keep victim awake until medical assistance arrives. NOTE: Alcohol lowers body temperature!
- **Frostbite.** Frostbite is the actual freezing of body tissue. There are three degrees of frostbite:

1. First degree: freezing without blistering or peeling;
2. Second degree: freezing with blistering or peeling;
3. Third degree: freezing with skin tissue death and possible deep tissue damage.

The extremities are most commonly affected: frostbite generally first appears in toes, fingers, nose and ears. Frostbite does not occur until the temperature falls below 30.2° F; however, frostbite can occur when bare skin comes into contact with objects whose surface temperature is below freezing. The first warning of frostbite is often a sharp prickling sensation. Frostbitten skin is characterized initially by turning red, then blue/red, and finally by loss of color and feeling. Frostbite damage may be reversible if treated in the first 12 to 24 hours. If not treated, frostbitten areas may become gangrenous. Workers who have suffered frostbite are susceptible to future recurrences. Deeply frostbitten tissue is characterized by cold, pale or darkened tissue that is solid to the touch. To treat frostbite, the affected area should be gradually warmed, but do not raise the temperature much above that of the body. Do not rub the frostbitten part or break any blisters. Wrap the affected part lightly. Provide warm drinks (not caffeinated or alcoholic), and do not let the victim smoke. The victim should not use the affected limb or area until cleared by a physician.

- **Raynaud's Phenomenon**, also called "white fingers", is a loss of hand circulation associated with exposure to cold, and/or vibration. The onset of Raynaud's Phenomenon is gradual. The initial stage is manifested by occasional pain, and a slight loss of hand sensitivity. If removed from cold and vibration, it is usually reversible. As the condition worsens, pain and numbness increases, and finger sensitivity decreases. As the blood vessels are damaged, blood flow slows and the skin temperature decreases. In the pronounced stages, fingers become white and the hands permanently feel cold and moist.
- In order to prevent the onset of cold-induced illness, Site workers should practice preventative measures, such as:

1. Exposure to cold should be terminated for any employee when observable shivering occurs. The employee should warm up, and don additional clothing layers, before returning to work.
2. Workers who are **suffering from diseases or taking medication that interferes with normal body temperature regulation**, or which reduces tolerance to cold environments, should be excluded from prolonged work in cold below 30° F.
3. For **exposed** skin, continuous exposure should not be permitted when the **wind chill** reaches -25° F. If outside work must be conducted, cover all exposed skin with clothing, layering as necessary. Take frequent breaks in a warm shelter, loosening clothing to allow sweat to evaporate.
4. At air temperatures of 35.6° F or less, it is imperative that **workers who become immersed in water or whose clothing becomes wet** (from external sources, not incidental sweat) be immediately provided a change of clothing and observed for symptoms of hypothermia.
5. Cold temperatures increase the susceptibility to **vibration-induced injury**. When working in cold environments, limit exposure time to vibrating tools and mechanical processes.
6. **Dehydration** is common in cold environments, and may increase the susceptibility of the worker to cold injury by reducing blood flow to the extremities. Warm sweet drinks

and soups should be provided at the work site when appropriate. The intake of coffee and alcohol should be limited because of the diuretic and circulatory effects.

7. Older employees or those with circulatory problems may need to avoid extremely cold environments, or wear extra clothing. If in doubt, the employee should consult a physician.
8. Do not drink alcohol prior to entering the cold – alcohol reduces the body's temperature.
9. **Eye protection** for workers employed out-of-doors in a snow and/or ice covered terrain should be supplied. Safety glasses/goggles possessing ultraviolet/glare protection should be worn when there is an expanse of snow coverage causing a hazard from blowing ice crystals or reflective radiation.
10. In general, **mittens or gloves** should be worn whenever the air temperatures fall below 40° F. If the task precludes the wearing of gloves, then establish provisions to allow the workers to warm their hands. Mittens, snug at the wrist, are preferable to gloves for heat retention.
11. If the work involved presents the possibility of becoming wet through splashing, an **outer layer of clothing impermeable to water** should be worn.
12. If the ambient temperature is not excessively cold, but a low wind chill is present due to high winds, a **light windbreaker-type jacket** will significantly reduce the potential for cold stress. Wind is a robber of heat!
13. Use of **steel-toed safety shoes** may become uncomfortable, due to metal conductance of cold. If Site activities require safety boots, it may become necessary to substitute alternative protective footwear, such as high impact plastic/rubber footwear, during cold periods.
14. **Many layers of light clothing are better than one or two heavy layers**. The outer layer should be wind-resistant, and the layers should be capable of being vented at the wrist, neck and waist to reduce wetting by perspiration. Moisture (sweat) reduces the ability of the clothing to trap air, as well as removing heat from the skin surface as sweat evaporates.
15. **Bare skin to metal contact should be avoided** at absolute temperatures below 30.2 ° F. Metal tool handles should be covered by insulation, or insulating gloves should be worn. Employees should take care when handling evaporative liquids at air temperatures below 39.2° F. If these liquids are soaked into clothing or gloves, the rapid evaporative cooling can result in frostbite.
16. If work is continuously performed in a **wind chill** at or below 19° F a **heated shelter** (e.g., truck, trailer) nearby is required. Employees should monitor and be aware of the onset of hypothermia and/or frostbite.
17. For work in environments below 10° F **wind chill,** the buddy system should be implemented.

B. DRAINAGE CONDUIT PIPING SYSTEM INSPECTION

Personnel may have an infrequent need to open the manhole cover connected to the Knightsville drainage conduit, and enter to physically inspect the lateral line. This underground piping system is considered by OSHA as a permit-required confined space (PRCS), and entry into PRCS is always a dangerous activity. Therefore, all applicable requirements codified in 29 CFR 1910.146 – *Permit-Required Confined Space Entry* shall be followed when entering this

system. At a minimum, the following safety elements contained in this standard shall be implemented:

- Buddy System – At least two trained personnel shall be present when one member enters the manhole, one as attendant and one to enter and perform the inspection. Depending on entry tasks, more may be required. All team members shall have received adequate training on the hazards of confined spaces and the requirements of 29 CFR 1910.146.
- Written Confined Space Procedure – A written procedure presenting the hazards associated with PRCS entry, and the steps to be implemented to safety control expected hazards and perform assigned tasks shall be developed, and team members shall read and understand it.
- Entry Communication Method – Attendance must be in continual contact (visual, verbal or other) with entrant(s).
- Lighting – If the presence of a combustible atmosphere is possible, all entry equipment must be UL- rated either explosion-proof or intrinsically safe for use in explosive atmospheres.
- Written PRCS Permit - A written PRCS permit must be completed prior to initial entry, and posted outside the space entry point during the entry.
- Initial Pre-entry, and Subsequent Continual Space Atmospheric Monitoring – Monitoring for low O_2 levels, H_2S, CO and flammable gas/vapor concentrations, at a minimum.
- Other Possible PRCS Hazards – Water transfer piping may contain hazards other than atmospheric, such as the presence of rats, snakes, spiders, etc. Encounters should be anticipated, and plans developed for entrant exposure avoidance.
- Rescue Provisions - In accordance with 29 CFR 1910.146(k).

If the entrant employer has no current PRCS program or has never made PRCS entries before, it is strongly recommended that an Industrial Hygienist currently certified by the American Board of Industrial Hygiene (ABIH) in the Comprehensive practice of Industrial Hygiene (CIH) be retained for the purpose of developing the written PRCS procedure, overseeing the entry and providing appropriate training in accordance with 29 CFR 1910.146(g).

APPENDIX B - AS-CONSTRUCTED DRAWINGS

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APPENDIX B-12 – Upper Eureka Gulch Response Action Structures
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APPENDIX B-1 – Gemini/Bullion Beck Response Action Structures

APPENDIX B-2 – May Day/Godiva Response Action Structures

APPENDIX B-3 – Chief Mine #2 Response Action Structures

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APPENDIX B-9 – Open Cell Response Action Structures

APPENDIX B-10 – Chief Mill Site #1, Access Channel, and Gardner Canyon Response Action Structures

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APPENDIX C - MATERIAL SPECIFICATIONS

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APPENDIX C-2 – Chain Link Fence
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APPENDIX C-5 – Seeding and Sodding
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APPENDIX C-13 – Water Distribution System
APPENDIX C-14 – Excavation, Trenching, and Backfilling for Utilities Systems
APPENDIX C-15 – Excavation and Handling of Contaminated Materials
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APPENDIX C-1 – Perimeter Fence and Gate

APPENDIX C-2 - Chain Link Fence

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APPENDIX C-15 - Excavation and Handling of Contaminated Materials

APPENDIX C-16 – Topsoil and Select Fill

APPENDIX D - INSPECTION FORMS

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APPENDIX D-7 – McChrystal Drainage
APPENDIX D-8 – Eagle Bluebell Drainage
APPENDIX D-9 – Chief Mill Site Access Road and Drainage Channel
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APPENDIX D-14 – Knightsville Road

APPENDIX D-1 – Maintenance Inspection Report

APPENDIX D-2 – Bullion Beck Mill

APPENDIX D-3 – Bullion Beck Mine

APPENDIX D-4 – Gemini Mine

APPENDIX D-5 – Eureka City Yard

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APPENDIX D-7 – McChrystal Drainage

APPENDIX D-8 – Eagle Bluebell Drainage

APPENDIX D-9 – Chief Mill Site Access Road and Drainage Channel

APPENDIX D-10 – Chief Mine #2 and Access Road

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APPENDIX D-14 – Knightsville Road

APPENDIX E - MAP OF OPEN LANDS

APPENDIX F - CITY OF EUREKA, UTAH ZONING ORDINANCE CHAPTER 13, REGULATIONS AND PERMITTING PROCEDURES FOR EXCAVATIONS AND DEVELOPMENT IN THE EUREKA MILLS SUPERFUND SITE, APPENDIX A – SAMPLING AND ANALYSIS PLAN

The City of Eureka's zoning ordinance that will govern future excavation and development activities is still in draft form and has not yet been adopted by the Eureka City Council. Once the City of Eureka formally adopts the ordinance a copy of the ordinance will be added to this O/M Manual.